SPECIAL ISSUE CONTAINING THE PRELIMINARY ANNOUNCEMENT OF THE FIFTH NEW YORK MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES, DECEMBER 27, 1929, TO JANUARY 2, 1930.
EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY

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VOL. LXX, No. 1822

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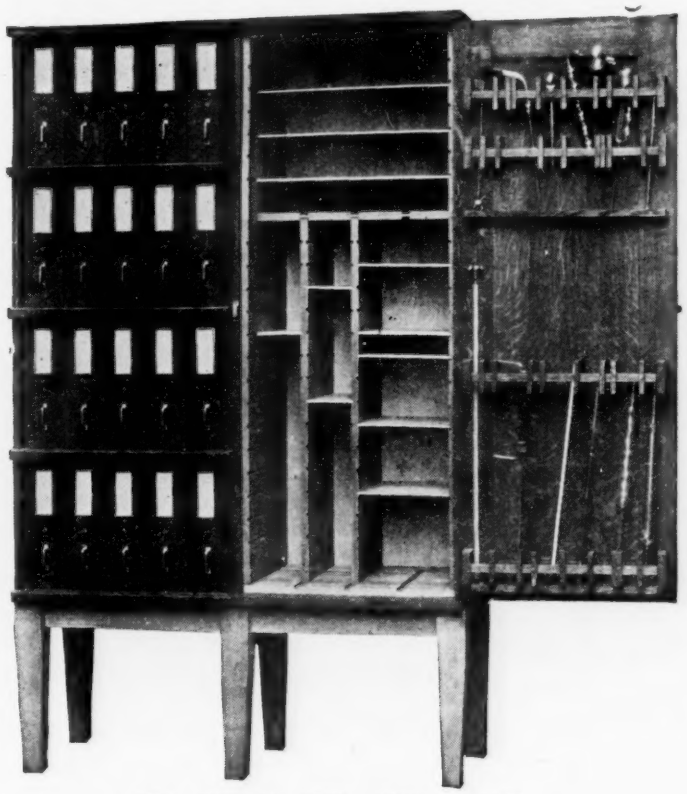

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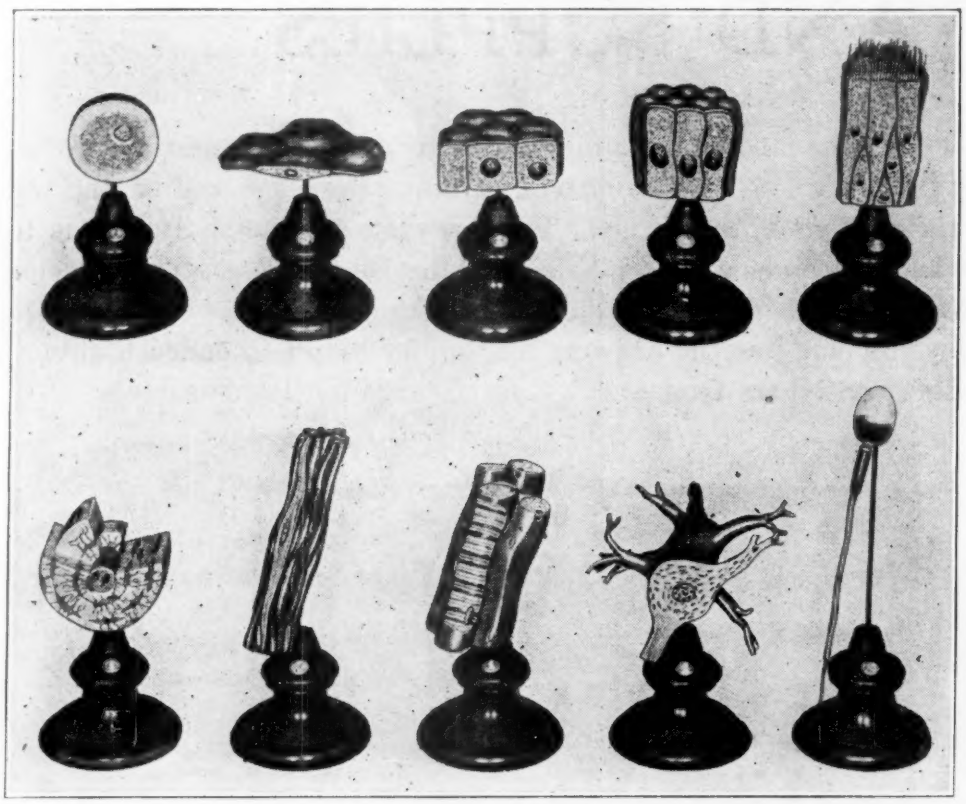

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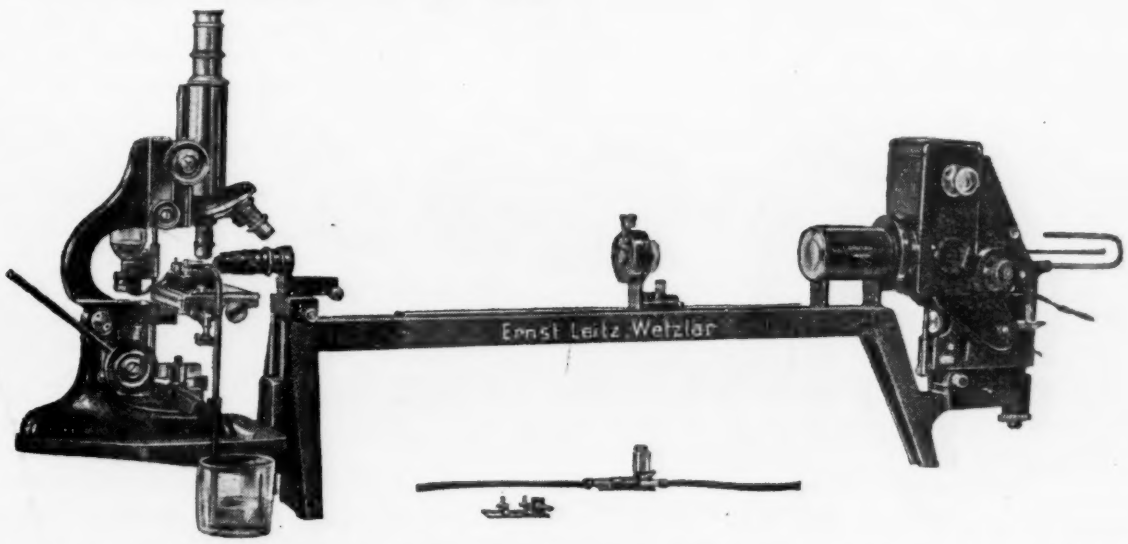

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SCIENCE

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SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS
New York City: Grand Central Terminal
Lancaster, Pa. Garrison, N. Y.
Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PRELIMINARY ANNOUNCEMENT OF THE DES MOINES MEETING

Edited by Professor BURTON E. LIVINGSTON
PERMANENT SECRETARY

ANNOUNCEMENTS AND REPORTS

THIS preliminary announcement is planned to give such information about the arrangements for the Des Moines meeting as can be published at this time, especially such information as may be useful before the opening of the meeting. Additional notes may appear in later issues of SCIENCE. This meeting will be the eighty-sixth meeting of the American Association. It will be the meeting for the association year 1929–1930. It will be the first meeting to be held in Des Moines. While it will probably not be as large a meeting as some of the recent ones it will be satisfactorily representative of the main fields of science, and those who attend will be able to make selection from a very large number of addresses and contributions touching all the sciences, which will fill convocation week very thoroughly. This is to be the annual week of American science and all who are interested in the advancement of science and education are cordially invited to be present throughout the whole week. The Des Moines sessions for the reading of papers will not be restricted to members of the association and the societies meeting with it, but they are to be freely open to every one.

The general program for this meeting, a book of over two hundred pages, will be available at the registration offices in the Shrine Temple, Des Moines, at nine o'clock on Friday, December 27, and thereafter. It will be supplied free to all who register and may be purchased by others. Any person who does not

attend the meeting may have a free copy of the program sent by mail as soon as it is published by writing to the permanent secretary's office, Smithsonian Institution Building, Washington, D. C., if the request is received before December 20. Requests received later may not receive attention until after the close of the meeting.

General reports of the meeting will be published in SCIENCE about February 1, probably filling most of the pages of two special issues. A free copy of the reports may be secured by any one, without regard to membership in the association or societies, if the request therefor is received by the permanent secretary before January 20. Of course all who regularly receive SCIENCE will receive the special issues without any special request.

IMPORTANT NOTICES FOR THOSE PLANNING TO ATTEND THE DES MOINES MEETING

Arrangements for hotel rooms at Des Moines should be made at once, or as soon as possible, by all who expect to be present at this meeting. A list of Des Moines hotels with pertinent information has appeared in SCIENCE for November 1, 1929, page 420, and headquarters hotels for the sections and societies as well as the locations of most of the session rooms are given in a later section of the present announcement. Requests for room reservations should be addressed directly to the hotels, stating the kind of room wanted in each instance and the date of the first night of occupancy.

All who are to present papers at this meeting should immediately send two copies of each paper to Mr. Austin H. Clark, director of the press service of the American Association, addressing them in the care of the permanent secretary's office in Washington. It is well to send a third copy to the section or society secretary in whose program the paper is to be presented. If the full manuscript can not be sent to Mr. Clark, be sure to send him two copies of an abstract.

When purchasing your railway ticket to Des Moines be sure to secure a certificate *for the Des Moines meeting of the American Association for the Advancement of Science and Associated Societies,* and bring the certificate with you to the registration offices for the meeting.

Members should bring with them to Des Moines their enrolment cards for 1929–30, which will serve to identify them as in good standing for the current year. These cards are somewhat smaller than those of recent years, to facilitate their being carried in pocket book or billfold. All who attend any of the Des Moines sessions should register with the American Association, whether or not they are members.

THE MAIN FUNCTIONS OF THE ANNUAL MEETINGS OF THE AMERICAN ASSOCIATION

(By Austin H. Clark)

The annual meetings of the American Association for the Advancement of Science and the associated organizations serve a double purpose. In the first place, they bring scientific workers together and give opportunity for the presentation of technical addresses and discussions on the latest advances in all lines of science. At these gatherings students in all branches of science are able to exchange ideas and information and by this means to get a clearer insight into what is being done in their own and in other fields than they could get merely by reading printed memoirs. Besides this the investigators, who are generally located in widely scattered universities, colleges, schools, museums or other institutions of learning throughout the country, are able to meet one another and to form or renew friendships which in later years serve to stimulate interest in the search for scientific truth. For the younger men especially this kind of personal contact is a very great advantage; they are able at these meetings to meet the recognized leaders in their several special lines, gaining by this means an increased confidence in the real value of their own work and learning how their special studies and investigations fit into the structure of science as a whole and into the structure of human activities and of human thought.

In the second place, the American Association realizes a great responsibility to the general public. The ultimate aim of all scientific work is the betterment of human welfare, both in its material and in its non-material aspects. Every established scientific fact and every well-grounded generalization has a definite bearing on some phase or other of human activity or of human thought. The curious facts of one decade may become correlated to give the basic principles of the next decade. The possibilities for the advance of science and for its incorporation into the life of the community appear to be unlimited, but science can not advance far unless it has the confidence of the people as a whole, nor can the people gain much from scientific work unless science is presented to them in ways to attract their attention and command their interest. The association therefore aims to facilitate and encourage interest and appreciation of science on the part of intelligent people in general and to aid in the humanizing of science as much as possible. At each annual meeting there are given a number of non-technical lectures, addressed to the public, which present scientific subjects in a broad way and in readily intelligible language. These lectures show samples of the recent results of scientific study and illustrate the manner in which the generalizations

and theories of science are gradually built up from observational data by means of constructive correlation. They also deal with the more concrete problem of just how scientific knowledge is practically useful in our daily lives. Also, because we must look forward to the day when scientific work must pass into the hands of the coming generation, the association arranges for its meetings a number of talks planned especially for the youth of the community. These are given by recognized authorities but in simple language and in an interesting style.

The speakers for the non-technical lectures to be given at Des Moines are being selected by a special committee, of which Dr. D. W. Morehouse is chairman, and these lectures promise to surpass those given at earlier meetings in interest and timeliness as well as in number and variety.

The Press Service of the American Association is arranging, as is usual at the annual meetings, for releasing to the daily press material from the Des Moines programs, for "science stories" that will interest the public. Many such articles will appear in the newspapers of the United States and Canada in the week of the meeting and thereafter. In recent years some of these have been copied repeatedly and have eventually found their way around the world. The representatives of the press, including Science Service, have been very cordial in their cooperation with the Press Service in this endeavor and their aid is assured for the meeting now announced.

Another means for encouraging public confidence in science and scientific workers and for bringing science directly to the people has recently become available through the development of radio broadcasting and radio reception, and the association has provided many brief radio talks on scientific topics from its recent meetings. Such talks, by eminent workers in science and popular lecturers and writers, are heard at great distances, sometimes throughout the United States and even beyond its borders. An excellent series of radio talks is being arranged for the Des Moines meeting by the Press Service, with the cooperation of Science Service and the broadcasting organizations.

ANNUAL MEETINGS PREVIOUSLY HELD IN THE WEST

In the eighty-one years of the existence of the American Association only six annual meetings have been held west of the line joining Chicago, St. Louis and New Orleans. In August, 1893, the meeting place was Madison, Wisconsin; Dubuque, Iowa, was the meeting place in August, 1872; two annual meetings have been held at Minneapolis, Minnesota, in August, 1883, and December, 1910; the meeting of December, 1925, was held at Kansas City, Missouri, and Denver was the meeting place in August, 1901. The intervals between these western meetings were eleven, ten, eight, nine and fifteen years, but it is now only four years since the Kansas City meeting, which was unusually successful in many ways. The people of Des Moines will welcome this meeting with characteristic cordiality and the local arrangements will be excellent.

SOME FEATURES OF GENERAL INTEREST AT THE DES MOINES MEETING

The Des Moines meeting is to be held under the presidency of Dr. Robert A. Millikan, one of our great leaders in physical research, director of the Norman Bridge Physical Laboratory, of the California Institute of Technology, Pasadena. President Millikan is to give a public address in the Shrine Temple on Sunday afternoon at three o'clock on "The Alleged Sins of Science." The retiring president for this meeting is Professor Henry Fairfield Osborn, well known for his popular writings as well as for his productive and important research work in paleontology and for his fine accomplishment in the development of the American Museum of Natural History, in New York City, of which he is president. Professor Osborn will deliver the main address of the official opening session, in the Shrine Temple, on Friday evening, December 27, at 8:15. His subject will be "The Discovery of Tertiary Man." As usual, the annual Sigma Xi lecture will be given in the evening of the second day of the meeting, which will be Saturday, December 28. This annual lecture is regularly arranged by the Society of the Sigma Xi, being presented at a general session of the American Association. The lecturer this year is Dr. George H. Parker, one of America's leading zoologists, of Harvard University, who will speak on "What Are We About?" The lecturer at the general session Monday evening is to be announced later. On Tuesday evening there will be a lecture by Dr. George F. Kay, of the University of Iowa, on the Pleistocene geology of the Iowa region, with results of recent studies on glaciation in that region and with reference to the influence of glaciation on present human culture. Dr. A. E. Kennelly, of Harvard University, will speak before the general session of the association on Wednesday evening, his subject being "The Laws of Fatigue, Men and Horses." The Josiah Willard Gibbs lecture, arranged each year by the American Mathematical Society, will be given on Tuesday afternoon at 4:30 o'clock by Dr. Irving Fisher, of Yale University. Dr. Fisher's topic will be "The Application of Mathematics to the Social Sciences." Many non-technical lectures, in addition to the ones mentioned above, are being arranged by a special committee, and this meeting will surpass all earlier ones in this respect. A general session on Monday

or Tuesday will be devoted to the economic aspect of the present status of science workers, the program being in charge of the Committee of One Hundred on Scientific Research, of which Dr. Rodney H. True, of the University of Pennsylvania, is secretary.

The general reception will be held in the Shrine Temple on Friday evening, December 27, following the opening session. The general exhibition of apparatus, materials and books will be a social gathering place for the meeting. It will be housed in the Shrine Temple.

The association is greatly indebted to Dr. D. W. Morehouse, president of Drake University, Des Moines, who is general chairman of the local committee for this meeting, and to the other members of the local committee. To their early, continued and untiring efforts will be due all the local arrangements. The difficult problem of room assignments for the many sessions has been very ably handled. Mr. George E. Hamilton, of the Des Moines Convention Bureau, is secretary of the local committee. He and his bureau have given much valuable service to the association. The members of the general committee, most of whose members are chairmen of special committees, and the local representatives of the sections are named below.

THE GENERAL LOCAL COMMITTEE FOR THE DES MOINES MEETING

D. W. MOREHOUSE, president of Drake University, *general chairman of the local committee.*

J. W. STUDEBAKER, *vice-chairman;* superintendent of the Des Moines Public Schools.

L. B. SPINNEY, *vice-chairman;* Iowa State College, Ames, Iowa.

G. E. HAMILTON, *secretary of the general committee and chairman of the special committee on hotels, dinners, etc.;* Des Moines Convention Bureau.

WALTER L. BIERRING, *chairman of the special committees on finance and local membership;* 1210 Bankers Trust Building.

T. J. EDMONDS, *chairman of the special committee on news service;* Iowa Tuberculosis Association, 518 Frankel Building.

E. C. LYTTON, *chairman of the special committee on personnel and registration;* Drake University.

HENRY NOLLEN, *chairman of the special committee on reception and entertainment;* Equitable Life Insurance Company of Iowa, Equitable Building.

C. L. PYE, *chairman of the special committee on meeting places, equipment and exhibits;* Iowa State Teachers Association, 416 Shops Building.

R. C. WOOLMAN, *chairman of the special committee on local transportation, information, signs, etc.;* Independent School District, 629 Third St.

LOCAL REPRESENTATIVES FOR THE ASSOCIATION SECTIONS AT DES MOINES

Section A (Mathematics), I. F. Neff, 2801 Brattleboro Ave., Des Moines.

Section B (Physics), P. S. Helmick, Drake University, Des Moines.

Section C (Chemistry), A. J. Rider, 1315 41st St., Des Moines.

Section D (Astronomy), D. W. Morehouse, Drake University, Des Moines.

Section E (Geology and Geography), Jas. H. Lees, Iowa Geological Survey, State House, Des Moines.

Section F (Zoological Sciences), L. S. Ross, 1308 27th St., Des Moines.

Section G (Botanical Sciences), I. E. Melhus, Iowa State College, Ames.

Section H (Anthropology), Sherman Kirk, 1060 31st St., Des Moines.

Section I (Psychology), R. H. Sylvester, 1606 Pleasant St., Des Moines.

Section K (Social and Economic Sciences), Herbert W. Bohlman, 1000 20th St., Des Moines.

Section L (Historical and Philosophical Sciences), Olynthus B. Clark, 1234 32nd St., Des Moines.

Section M (Engineering), Anson Marston, Iowa State College, Ames.

Section N (Medical Sciences), John H. Peck, 1222 Bankers Trust Bldg., Des Moines.

Section O (Agriculture), Mark Thornburg, State House, Des Moines.

Section Q (Education), W. F. Barr, Drake University, Des Moines.

Representative for organizations not related to any particular section, Jean Carroll, Meredith Publications, Des Moines.

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Robert A. Millikan, California Institute of Technology, Pasadena, Calif.

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Henry Fairfield Osborn, American Museum of Natural History, New York, N. Y.

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Retiring Vice-president, C. E. Kenneth Mees, Eastman Kodak Co., Rochester, N. Y.

Secretary, R. R. Renshaw, New York University, New York, N. Y.

Section D (Astronomy):

Vice-president, Harlow Shapley, Harvard University, Cambridge, Mass.

Retiring Vice-president, J. S. Plaskett, Dominion Astrophysical Observatory, Victoria, B. C., Canada.

Secretary, Philip Fox, Northwestern University, Evanston, Ill.

Section E (Geology and Geography):

Vice-president, George Frederick Kay, University of Iowa, Iowa City, Iowa.

Retiring Vice-president, Frank Leverett, University of Michigan, Ann Arbor, Mich.

Secretary, Kirtley F. Mather, Harvard University, Cambridge, Mass.

Section F (Zoological Sciences):

Vice-president, Charles Manning Child, University of Chicago, Chicago, Ill.

Retiring Vice-president, Michael F. Guyer, University of Wisconsin, Madison, Wis.

Secretary, Geo. T. Hargitt, Syracuse University, Syracuse, N. Y.

Section G (Botanical Sciences):

Vice-president, J. Arthur Harris, University of Minnesota, Minneapolis, Minn.

Retiring Vice-president, C. E. Allen, University of Wisconsin, Madison, Wis.

Secretary, Sam F. Trelease, Columbia University, New York, N. Y.

Section H (Anthropology):

Vice-president, A. V. Kidder, Phillips Academy, Andover, Mass.

Retiring Vice-president, Fay-Cooper Cole, University of Chicago, Chicago, Ill.

Secretary, Charles H. Danforth, Harvard Medical School, Boston, Mass.

Section I (Psychology):

Vice-president, Madison Bentley, Cornell University, Ithaca, N. Y.

Retiring Vice-president, Howard C. Warren, Princeton University, Princeton, N. J.

Secretary, John E. Anderson, Institute of Child Welfare, University of Minnesota, Minneapolis, Minn.

Section K (Social and Economic Sciences):

Vice-president, Henry Lewis Rietz, University of Iowa, Iowa City, Iowa.

Secretary, Charles F. Roos, Cornell University, Ithaca, N. Y.

Section L (Historical and Philological Sciences):

Vice-president, Henry Osborn Taylor, 135 East 66th St., New York, N. Y.

Retiring Vice-president, G. M. Bolling, 777 Franklin Ave., Columbus, Ohio.

Secretary of the Subsection on Linguistics, Leonard Bloomfield, University of Chicago, Chicago, Ill.

Secretary of the Subsection on Historical Sciences, Joseph Mayer, 26 Jackson Place, Washington, D. C.

Section M (Engineering):

Vice-president, H. F. Moore, University of Illinois, Urbana, Ill.

Retiring Vice-president, Robert Lemuel Sackett, Pennsylvania State College, State College, Pa.

Secretary, N. H. Heck, U. S. Coast and Geodetic Survey, Washington, D. C.

Section N (Medical Sciences):

Vice-president, Ludvig Hektoen, University of Chicago, Chicago, Ill.

Retiring Vice-president, A. J. Goldforb, College of the City of New York, New York, N. Y.

Secretary, Charles W. M. Poynter, College of Medicine, University of Nebraska, Omaha, Nebr.

Section O (Agriculture):

Vice-president, Merritt F. Miller, University of Missouri, Columbia, Mo.

Retiring Vice-president, C. A. Mooers, University of Tennessee, Knoxville, Tenn.

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

Section Q (Education):

Vice-president, Frank N. Freeman, University of Chicago, Chicago, Ill.

Retiring Vice-president, Truman L. Kelley, Stanford University, Calif.

Secretary, Willis L. Uhl, University of Washington, Seattle, Wash.

Permanent Secretary

Burton E. Livingston, Johns Hopkins University, Baltimore, Md. (Association mail address: Smithsonian Institution Building, Washington, D. C.)

General Secretary

Frank R. Lillie, University of Chicago, Chicago, Ill.

Treasurer

John L. Wirt, Carnegie Institution of Washington, Washington, D. C.

Secretary of the Council and Program Editor

Sam F. Trelease, Columbia University, New York, N. Y.

Executive Assistant

Sam Woodley, Smithsonian Institution Building, Washington, D. C.

Auditor

A. G. McCall, U. S. Department of Agriculture, Washington, D. C.

Director of Press Service

Austin H. Clark, U. S. National Museum, Washington, D. C.

Exhibition Manager

H. S. Kimberly, Smithsonian Institution Building, Washington, D. C.

Members of the Executive Committee of the Council[1]

J. McKeen Cattell (1930), *chairman;* Garrison-on-Hudson, N. Y.

Karl T. Compton (1929), Princeton University, Princeton, N. J.

[1]The number in parenthesis denotes the calendar year at the end of which the member's term of office is to expire.

David R. Curtiss (1931), Northwestern University, Evanston, Ill.
Joel H. Hildebrand (1931), University of California, Berkeley, Calif.
Vernon Kellogg (1932), National Research Council, Washington, D. C.
Frank R. Lillie (1932), *general secretary;* University of Chicago, Chicago, Ill.
Burton E. Livingston (1932), *permanent secretary;* Johns Hopkins University, Baltimore, Md.
Robert A. Millikan (1929), *president* of the association; California Institute of Technology, Pasadena, Calif.
F. R. Moulton (1929), 327 S. La Salle St., Chicago, Ill.
Henry B. Ward (1930), University of Illinois, Urbana, Ill.
Edwin B. Wilson (1932), Social Science Research Council, 230 Park Ave., New York, N. Y.

The Council of the Association

The council consists of: (1) the president, the general secretary, the permanent secretary and the treasurer; (2) the members of the executive committee not otherwise members of the council; (3) the chairmen of the sections; (4) the section secretaries; (5) the representatives of the affiliated organizations, and (6) eight elected members. The elected members of the council are as follows, the number shown in parenthesis being that of the calendar year at the end of which the member's term of office is to expire.

L. O. Howard (1932), U. S. Department of Agriculture, Washington, D. C.
D. T. MacDougal (1932), Desert Laboratory, Tucson, Ariz.
Austin H. Clark (1931), U. S. National Museum, Washington, D. C.
Arthur H. Compton (1931), University of Chicago, Chicago, Ill.
L. E. Dickson (1930), University of Chicago, Chicago, Ill.
David White (1930), U. S. Geological Survey, Washington, D. C.
John C. Merriam (1929), Carnegie Institution of Washington, Washington, D. C.
Rodney H. True (1929), University of Pennsylvania, Philadelphia, Pa.

Members of the Committee on Grants for Research[2]

Charles P. Berkey (1932), for Geology; Columbia University, New York, N. Y.
William Charles White (1932), for Medicine; Hygienic Laboratory, U. S. Public Health Service, Washington, D. C.
Walter S. Adams (1931), for Astronomy; Mt. Wilson Observatory, Pasadena, Calif.
Karl F. Kellerman (1931), for Botany; Bureau of Plant Industry, Washington, D. C.
W. Lash Miller (1930), for Chemistry; 8 Hawthorne Ave., Toronto, Ont., Canada.
Oswald Veblen (1930), for Mathematics; Princeton University, Princeton, N. J.

[2] The number in parentheses denotes the year at the end of which the member's term of office is to expire.

L. G. Hoxton (1929), *Chairman of the Committee,* for Physics; University of Virginia, Charlottesville, Va.
Vernon Kellogg (1929), for Zoology; National Research Council, Washington, D. C.

Members of the Finance Committee

George K. Burgess (1932), *Chairman of the Committee,* U. S. Bureau of Standards.
Arthur L. Day (1931), Geophysical Laboratory, Carnegie Institution of Washington.
A. F. Frissell (1929), 530 Fifth Ave., New York City.
Herbert Gill (1930), Bethesda, Md.
John L. Wirt (1932), Treasurer of the Association, Carnegie Institution of Washington.

The Standing Committee of One Hundred on Scientific Research

Chairman, Robert A. Millikan, President of the American Association.
Secretary, Rodney H. True, University of Pennsylvania, Philadelphia, Pa.

The Secretaries' Conference

Chairman, George T. Hargitt, Syracuse University, Syracuse, N. Y.
Secretary, Philip Fox, Dearborn Observatory, Northwestern University, Evanston, Ill.

The Academy Conference

Chairman, Howard E. Enders, Department of Biology, Purdue University, LaFayette, Ind.
Secretary, D. W. Morehouse, Drake University, Des Moines, Iowa.

The Committee on the Place of Science in Education

Chairman, Otis W. Caldwell, Columbia University, New York, N. Y.

The Committee on Source Books in the History of Science

Chairman, Gregory D. Walcott, Long Island University, Brooklyn, N. Y.

The Committee on Booklists for Popular Reading in Science

Chairman, Joseph L. Wheeler, Enoch Pratt Free Library, Baltimore, Md.

Members of the Committee on Prize Awards for the Des Moines Meeting

Charles E. Allen (*chairman*), University of Wisconsin.
P. W. Bridgman, Harvard University.
Fay-Cooper Cole, University of Chicago.
S. C. Lind, University of Minnesota.
H. L. Rietz, University of Iowa.

ORGANIZATIONS THAT ARE TO HOLD SESSION AT DES MOINES, WITH DATES OF THEIR SESSIONS AND OTHER INFORMATION

Note.—Names of organizations are arranged in the order of the association sections. Each affiliated society has one or two representatives in the association council, as indicated by one or two asterisks before the society

name. A cross before a name indicates that the society is associated but not affiliated. The president, secretary and council representatives are named for each associated or invited society. Officers of the sections of the association have been named in an earlier part of this announcement. Dates of meetings are to be read as inclusive. Hotel headquarters and meeting places are generally shown. In a few instances some data are omitted because of lack of information.

A. Mathematics.

** American Mathematical Society. December 30 to January 1. Headquarters and meeting place, Fort Des Moines Hotel. *President,* E. R. Hedrick; *secretary,* R. G. D. Richardson, Brown University, Providence, R. I.; *council representatives,* Louis Ingold and Mark H. Ingraham.

** Mathematical Association of America. December 30 to January 1. Headquarters and meeting place, Fort Des Moines Hotel. *President,* J. W. Young; *secretary,* W. D. Cairns, Oberlin College, Oberlin, Ohio; *council representatives,* W. D. Cairns and Dunham Jackson.

B. Physics.

** American Physical Society. December 30 to January 1. Headquarters and meeting place, Hotel Savery. *President,* H. G. Gale; *secretary,* Willard L. Severinghaus, Columbia University, New York, N. Y.; *council representatives,* Karl T. Compton and P. S. Helmick.

* American Meteorological Society. December 27 and 28. Headquarters and meeting place, Fort Des Moines Hotel. *President,* W. J. Humphreys; *secretary,* Charles F. Brooks, Clark University, Worcester, Mass.; *council representative,* W. J. Humphreys.

C. Chemistry.

Section C, with the Midwest Regional Group of the American Chemical Company and the Iowa State College Section of the American Chemical Society. December 27 and 28. Headquarters and meeting place, Fort Des Moines Hotel.

D. Astronomy.

Section D. December 30 and 31. Headquarters and meeting place, Fort Des Moines Hotel.

E. Geology and Geography.

Section E. December 30 and 31. Headquarters, Brown Hotel; meeting place, Young Men's Christian Association.

F. Zoological Sciences.

** American Society of Zoologists. December 30 to January 1. Headquarters and meeting place, Hotel Savery. *President,* Caswell Grave; *secretary,* Dwight E. Minnich, University of Minnesota, Minneapolis, Minn.; *council representatives,* W. C. Allee and Frank Eugene Lutz.

** Entomological Society of America. December 28 to 30. Headquarters and meeting place, Hotel Savery. *President,* C. T. Brues; *secretary,* J. J. Davis, Purdue University, LaFayette, Ind.; *council representatives,* C. L. Metcalf and W. A. Riley.

** American Association of Economic Entomologists. December 30 to January 2. Headquarters and meeting place, Hotel Savery. *President,* T. J. Headlee; *secretary,* C. W. Collins, Melrose Highlands, Mass.; *council representatives,* C. H. Richardson and Franklin Sherman.

* American Society of Parasitologists. December 27 to 31. Headquarters and meeting place, Hotel Savery. *President,* N. A. Cobb; *secretary,* W. W. Cort, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.; *council representative,* Henry B. Ward.

† Wilson Ornithological Club. December 27 and 28. Headquarters, Hotel Savery; meeting place, City Library. *President,* Lynds Jones; *secretary,* Jesse M. Shaver, Peabody College, Nashville, Tenn.

G. Botanical Sciences.

Section G and associated societies. December 31. Headquarters, Fort Des Moines Hotel; meeting place to be announced.

** Botanical Society of America. December 30 to January 1. Headquarters and meeting place, Chamberlain Hotel. *President,* Margaret C. Ferguson; *secretary,* Arthur J. Eames, Cornell University, Ithaca, N. Y.; *council representatives,* A. H. Reginald Buller and I. F. Lewis.

** American Phytopathological Society. December 28 to 31. Headquarters, Chamberlain Hotel; meeting place, Grant Club. *President,* R. J. Haskell; *secretary,* F. C. Meier, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.; *council representatives,* C. W. Edgerton and Donald Reddick.

**American Society of Plant Physiologists. December 30 to January 1. Headquarters, Chamberlain Hotel; meeting place to be announced. *President,* Scott V. Eaton; *secretary,* Henry R. Kraybill, Purdue University, LaFayette, Ind.; *council representatives,* Charles A. Shull and P. D. Strausbaugh.

F–G. Societies related to both Section F and Section G.

** American Society of Naturalists. January 1. Headquarters, Chamberlain Hotel; meeting place to be announced. *President,* George H. Parker; *secretary,* L. J. Cole, University of Wisconsin, Madison, Wis.; *council representatives,* Charles Rupert Stockard and B. M. Duggar.

** Ecological Society of America. December 30 to January 1. Headquarters and meeting place, Chamberlain Hotel. *President,* W. C. Allee; *secretary,* A. O. Weese, University of Oklahoma, Norman, Okla.; *council representatives,* Royal N. Chapman and Homer LeRoy Shantz.

** American Microscopical Society. December 31. Headquarters, Chamberlain Hotel. *President,* Gilbert Morgan Smith; *secretary,* H. J. Van Cleave, University of Illinois, Urbana, Ill.; *council representatives,* Gilbert Morgan Smith and H. J. Van Cleave.

† Phi Sigma Biological Research Society. December 27 and 28. Headquarters, Chamberlain Hotel; meeting place to be announced. *President,* Paul B. Sears; *secretary,* A. I. Ortenburger, University of Oklahoma, Norman, Okla.

Genetics Sections, American Society of Zoology and Botanical Society of America. December 30 to January 1. Headquarters, Chamberlain Hotel; meeting place to be announced. *Chairman,* A. F. Blakeslee; *secretary,*

P. W. Whiting, University of Pittsburgh, Pittsburgh, Pa.

H. Anthropology.

Section H. December 30 and 31. Headquarters and meeting place, Fort Des Moines Hotel.

I. Psychology.

Section I. December 27 and 28. Headquarters and meeting place, Fort Des Moines Hotel.

K. Social and Economic Sciences.

Section K. December 28 to January 1. Headquarters and meeting place, Fort Des Moines Hotel.

† Metric Association. December 30. Headquarters, Fort Des Moines Hotel; meeting place to be announced. *President,* George F. Kunz; *secretary,* Howard Richards, 156 Fifth Ave., New York, N. Y.

L. Historical and Philological Sciences.

Section L, Part 1 (History of Science). Headquarters, Fort Des Moines Hotel; meeting place to be announced.

Section L, Part 2 (Linguistic Sciences). A session is being planned but no definite information is yet available.

M. Engineering.

Section M. December 28 to 30. Headquarters and meeting place, Fort Des Moines Hotel.

N. Medical Sciences.

Section N. December 31 to January 1. Headquarters and meeting place, Hotel Savery.

O. Agriculture.

** American Society of Agronomy. December 28. Headquarters, Randolph Hotel; meeting place, County Court House. *President,* M. J. Funchess; *secretary,* P. E. Brown, Iowa State College, Ames, Iowa.; *council representatives,* H. K. Hayes and R. M. Salter.

* Society of American Foresters. December 30 and 31. Headquarters, Randolph Hotel; meeting place to be announced. *President,* Paul G. Redington; *secretary,* R. E. Marsh, 517 Lenox Bldg., 1523 L St. N.W., Washington, D. C.; *council representative,* Harris Collingwood.

* American Society for Horticultural Science. December 30 to January 1. Headquarters, Randolph Hotel; meeting place, County Court House. *President,* V. R. Gardner; *secretary,* H. B. Tukey, New York State Agricultural Experiment Station, Geneva, N. Y.; *council representative,* W. H. Alderman.

† Association of Official Seed Analysts of North America. December 31 to January 2. Headquarters, Randolph Hotel; meeting place, County Court House. *President,* F. S. Holmes; *secretary,* A. L. Stone, University of Wisconsin, Madison, Wis.

† Potato Association of America. December 30 to January 1. Headquarters, Randolph Hotel; meeting place, County Court House. *President,* F. M. Harrington; *secretary,* H. C. Moore, Michigan State College, East Lansing, Mich.

Geneticists Interested in Agriculture. December 31. Headquarters, Randolph Hotel; meeting place to be announced. *Secretary,* H. L. Ibsen, Kansas State Agricultural College, Manhattan, Kans.

Q. Education.

Section Q. December 26 to 28. Headquarters and meeting place, Fort Des Moines Hotel.

X. Organizations related to the American Association as a whole.

* American Nature-Study Society. December 27 and 28. Meeting place, Insurance Exchange Building. *President,* Bertha C. Cady; *secretary,* Ellen Eddy Shaw, Brooklyn Botanic Garden, Brooklyn, N. Y.; *council representative,* J. Andrew Drushel, 209 Edgewood Avenue, Westfield, N. J.

** Society of the Sigma Xi. December 28. Meeting place, Fort Des Moines Hotel. *President,* F. R. Moulton; *secretary,* Edward Ellery, Union College, Schenectady, N. Y.; *council representatives,* Edward Ellery and F. R. Moulton.

** Honor Society of Phi Kappa Phi. December 31. Meeting place, Fort Des Moines Hotel. *President General,* R. C. Gibbs; *secretary general,* C. H. Gordon, University of Tennessee, Knoxville, Tenn.; *council representatives,* Carleton R. Ball and M. C. Merrill.

† Gamma Alpha Graduate Scientific Fraternity. December 30. Headquarters and meeting place, Fort Des Moines Hotel. *President,* G. W. Martin, *secretary,* Rodney W. Babcock, De Pauw University, Greencastle, Ind.

Sigma Delta Epsilon Graduate Women's Scientific Fraternity. December 30 and 31. Meeting place, Ranson Tea Room. *President,* Stella Mary Hague; *secretary,* Helen Jean Brown, Ohio State University, Columbus, Ohio.

ASSOCIATED SOCIETIES NOT MEETING WITH THE ASSOCIATION AT DES MOINES BUT MEETING ELSEWHERE IN CONVOCATION WEEK, WITH TIMES AND PLACES OF THEIR MEETINGS AND THE NAMES OF THEIR SECRETARIES

Note.—The information here given has been supplied by the society secretaries.

American Astronomical Society. Boston, Mass., December 30 to January 2. *Secretary,* R. S. Dugan, Princeton University Observatory, Princeton, N. J.

Geological Society of America. Washington, D. C., December 26 to 28. *Secretary,* Charles P. Berkey, Columbia University, New York, N. Y.

Paleontological Society of America. Washington, D. C., December 26 to 28. *Secretary,* R. S. Bassler, U. S. National Museum, Washington, D. C.

Mineralogical Society of America. Washington, D. C., December 26 to 28. *Secretary,* Frank R. Van Horn, Case School of Applied Science, Cleveland, Ohio.

Association of American Geographers. Columbus, Ohio, December 26 to 28. *Secretary,* D. H. Davis, University of Minnesota, Minneapolis, Minn.

National Council of Geography Teachers. Columbus, Ohio, December 26 to 28. *Secretary,* George J. Miller, State Teachers College, Mankato, Minn.

American Anthropological Association. Poughkeepsie, N. Y., December 27 to 29. *Secretary,* A. Irving Hallowell, University of Pennsylvania, Philadelphia, Pa.

Archaeological Institute of America. Boston, Mass., December 26 to 28. *Secretary*, Rollin H. Tanner, New York University, New York, N. Y.

American Folk-Lore Society. Poughkeepsie, N. Y., December 27 to 29. *Secretary*, Gladys A. Reichard, Barnard College, New York, N. Y.

American Economic Association. Washington, D. C., December 27 to 30. *Secretary*, Frederick S. Deibler, Northwestern University, Evanston, Ill.

American Sociological Society. Washington, D. C., December 27 to 30. *Secretary*, Ernest W. Burgess, University of Chicago, Chicago, Ill.

American Statistical Association. Washington, D. C., December 27 to 30. *Secretary*, Willford I. King, 236 Wooster St., New York, N. Y.

History of Science Society. Durham, N. Car., December 28 to 29. *Secretary*, Frederick E. Brasch, Library of Congress, Washington, D. C.

Linguistic Society of America. Cleveland, Ohio, December 30 and 31 and January 1. *Secretary*, Roland G. Kent, University of Pennsylvania, Philadelphia, Pa.

Society of American Bacteriologists. Ames, Iowa, December 30 and 31 and January 1. *Secretary*, J. M. Sherman, Cornell University, Ithaca, N. Y.

American Philosophical Association. Eastern Division: New York City, between Christmas and New Year's; Western Division: Los Angeles, between Christmas and New Year's. *Secretary*, H. G. Townsend, University of Oregon, Eugene, Oregon.

Phi Delta Kappa Fraternity. Chicago, Ill., December 31. *Secretary*, Paul M. Cook, 1800 Republic Bldg., Chicago, Ill.

American Association of University Professors. Durham, N. Car., December 28; Chapel Hill, N. Car., December 30. *Secretary*, H. W. Tyler, Massachusetts Institute of Technology, Cambridge, Mass.

Bibliographical Society of America. Chicago, Ill., December 28. *Secretary*, A. H. Shearer, Grosvenor Library, Buffalo, N. Y.

THE AMERICAN ASSOCIATION PRESS SERVICE AT THE DES MOINES MEETING

(*By Austin H. Clark*)

The Press Service of the American Association for the Advancement of Science, which has developed from the earlier news service, furnishes to the public, by means of the press, readable and timely accounts of scientific news. It brings scientific workers and newspaper writers together for their mutual aid and for the dissemination of science news. For the Des Moines meeting releases for the press will be prepared beforehand, from manuscripts and abstracts received from those who are to present papers or give addresses at the meeting. All who are to present papers at Des Moines are asked to send, as soon as possible, duplicate copies of each of their manuscripts, to the A. A. A. S. Press Service (A. A. A. S. P. S.), Smithsonian Institution Building, Washington, D. C. A single copy will not suffice and both copies are to be sent to the same address. Each manuscript should bear, at the top of the first page, the name of the organization before which the paper is to be presented, with information as to the date of presentation as nearly as that may be stated.

Whenever a paper for this or any other scientific meeting is being typed it will be advantageous to all concerned, including the public, if several clear carbon copies are made; such manifolding is readily accomplished and results in copies enough so that two can be sent at once to the association. Other copies should be sent to the secretaries of the organizations at whose sessions the papers are to be given. The manuscripts sent to the association are not for publication as such. They are used by newspaper writers in the preparation of science news. No news story is released before the date on which the paper is presented at the meeting. The Press Service supplies the representatives of the press with the material received from the authors, the date of release being marked on each sheet. It sometimes furnishes such additional information as may be available and it aids press representatives to secure interviews with authors when such interviews are requested.

All manuscripts for use in connection with the Des Moines meeting should reach the Washington office by December 20. Manuscripts that arrive later may not receive attention. The best science stories are written long before the meeting opens, when the writers may have time for consultation and study in their preparation. It is best to have manuscripts in the hands of the Press Service before December 1. If full manuscripts can not be sent, then authors of papers and addresses for this meeting should send two copies of an adequate abstract of each paper.

Both manuscripts and abstracts should be written in the simplest possible language, so as to be readily understood by any educated person with no presupposed knowledge of the subject treated. Especially should the broader aspects of the subject be presented and its possible bearing on work in other lines and on thought in general.

Until the date of release all author's manuscripts are regarded as strictly confidential communications, accessible only to accredited representatives of the press and to the members of the association's committee on prize award. There need be no hesitation about sending accounts of new and unpublished work. Authors may themselves send additional copies to newspaper representatives or to the news-gathering agencies, but articles based on such copies may not always be used under the sponsorship of the American Association's Press Service. In any event, two copies are needed by the Press Service.

The director of the Press Service, Austin H. Clark, is ready at all times to answer questions regarding the

work of the service and to aid authors and press writers as far as possible. But it must be remembered that Mr. Clark is apt to be pressed for time in the last ten days before a meeting opens. In that period it is difficult for him to do justice to all communications.

The press is now by far the most important medium for the dissemination of scientific knowledge among the people. It is consequently a duty of science workers to do their part, to the end that their findings and ideas may be clearly set before the public. Prepare readable manuscripts and send them early and in duplicate.

THE DES MOINES AWARD OF THE AMERICAN ASSOCIATION PRIZE

The seventh annual award of the American Association prize, of one thousand dollars, will occur at the close of the Des Moines meeting. Through the generosity of an anonymous member six of these prizes have been awarded by the association and it is expected that these annual awards will continue indefinitely. The prize is awarded each year to the author of a noteworthy paper presented at the annual meeting. All papers presented at the Des Moines meeting are to be automatically eligible for consideration by the committee on prize award, the membership of which is shown on an earlier page of this announcement. It is not necessary that an author be a member of the association. There is to be no open competition and no submitting of papers for the prize. It is supposed, however, that manuscripts of papers that may possibly be considered by the committee on prize award will all be in the hands of the Press Service, through the arrangements described above. No special action should be taken by authors who hope to be considered in this connection and no attempt should be made to enlighten members of the committee excepting at their own request. The secretary in charge of each scientific program will be expected to present one or more nominations for consideration by the committee and the committee is expected to make selection from the nominations thus submitted. Nominations are to be in writing, signed by the secretary who sends them, and they are to be addressed to the committee on award, care of Sam Woodley, *executive assistant*, at the registration offices in the Shrine Temple, or else they may be sent to Mr. Woodley in the Fort Des Moines Hotel. Secretaries and members of the committee may examine the manuscripts that have been received by the Press Service, which will have offices in the Shrine Temple. In making the award the committee is instructed to make no attempt to select the "best" paper presented, for useful comparisons are not possible in different fields of science; the intention is simply that the prize shall be awarded to the author of some notable contribution presented at Des Moines. Previously published work may be considered when pertinent. The donor of the prize desires to aid younger authors by this means rather than to honor older men. The prize is not to be awarded in the same field of science for two consecutive years. The permanent secretary and the other general officers of the association have nothing at all to do with the award, nor can they be in position to give out any information concerning the nominations until after the award has been officially announced through the Press Service. The proceedings of the committee on prize award are to be strictly confidential.

The name of the prize winner will be announced in the daily press throughout the United States and Canada, probably on Thursday or Friday, January 2 or 3, and the permanent secretary's office will inform the winner, by telegram if that means is necessary. The treasurer's check for one thousand dollars will be issued to the winner of the prize just as soon as possible after the close of the meeting.

A list of the names of those to whom the association prize has been awarded is shown below, together with the topics dealt with in the winning papers.

(1) The Cincinnati award, January, 1924. L. E. Dickson, for contributions to the theory of numbers.

(2) The Washington award, January, 1925. Divided equally between Dr. Edwin P. Hubble, for contributions on spiral nebulae, and Dr. L. R. Cleveland, for contributions on the physiology of termites and their intestinal protozoa.

(3) The Kansas City award, January, 1926. Dr. Dayton C. Miller, for contributions on the ether-drift experiment.

(4) The Philadelphia award, January, 1927. Dr. George D. Birkhoff, for mathematical criticism of some physical theories.

(5) The Nashville award, January, 1928. H. J. Muller, for contributions on the influence of X-rays on genes and chromosomes.

(6) The New York award, January, 1929. Oliver Kamm, for contributions on the hormones of the pituitary gland.

TRANSPORTATION TO AND FROM DES MOINES

Reduced railway rates, by the certificate plan, have been granted for this meeting by the railway passenger associations of the United States and Canada, whose courtesy and public spirit will be greatly appreciated. The round-trip fare for a person attending the meeting is to be one and one half times the regular one-way fare.

Tickets to Des Moines are to be purchased within time limits as follows: December 24 to 30, inclusive,

for the following lines: Canadian Eastern lines, Central lines, Southeastern lines and Trunk lines. For New England lines the time limits are December 23 to 29, inclusive. For the Western and Transcontinental lines the inclusive dates are December 20 to 26 from California; December 21 to 27 from Arizona, British Columbia, Nevada, northern Idaho, Washington and Oregon (except *via* California); December 19 to 25 from Oregon (*via* California); December 22 to 28 from Montana, southern Idaho and Utah; December 23 to 29 from New Mexico, Wyoming and Colorado (except Julesburg); December 24 to 30 from Julesburg, Colorado, and from Illinois, Iowa, Kansas, Manitoba, Minnesota, Missouri, Nebraska, northern Michigan, North Dakota, South Dakota and Wisconsin. For the Southwestern lines the inclusive dates are December 23 to 29 from Texas and December 24 to 30 from Arkansas, Kansas, Louisiana, Missouri and Oklahoma; also from Memphis, Tennessee, and Natchez, Mississippi. The following Southwestern lines do not offer the reduced excursion fares: Arkansas and Louisiana-Missouri Railway, Fort Smith and Western Railroad, Graysonia, Nashville and Ashdown Railroad, Kansas, Oklahoma and Gulf Railway, Mississippi River and Bonne Terre Railway and National Railways of Mexico. The Canadian Western lines are unable to offer reduced railway fares from points in their territory.

Persons residing in the regions of reduced rates (almost all the United States and Canada) should each purchase a first-class, full-fare, one-way, through ticket to Des Moines, being sure to secure a certificate on the "Standard Certificate Form," reading for the Des Moines meeting of the "American Association for the Advancement of Science and Associated Societies." A receipt is not required and will not be useful.

Persons residing outside the regions of reduced rates should each purchase a round-trip ticket to the nearest station issuing through tickets to Des Moines and situated within the region of reduced rates. On arrival at that station a one-way ticket to Des Moines and a certificate, as directed in the preceding paragraph, should be secured.

Upon arrival at Des Moines every one should register immediately, at the registration offices for the meeting, in the Shrine Temple, located on Pleasant St. between Ninth and Tenth Sts. Be sure to fill in all blanks on the registration card and leave the card at the registration desk, where you will receive a numbered identification card, which will be receipted for the registration fee paid. (See Registration, below.) Then leave your railway certificate at the validation desk, being sure that the identification card (which you keep) is there marked to show that you have deposited a certificate. Your certificate will subsequently be endorsed by the association and then validated by the agent of the transportation companies. Call for it later at the validation desk, where you left it, presenting your identification card.

Unvalidated certificates will not be honored for the purchase of return tickets and unendorsed certificates can not be validated. Registration is therefore necessary in order to have a railway certificate validated. Each person registering is entitled to the validation of his own certificate.

For the return trip, railway agents at Des Moines will honor any properly endorsed and validated certificate if presented at least thirty minutes before the scheduled time of departure of the train for which it is to be used. Each person presenting an endorsed and validated certificate may purchase a continuous-passage one-way, return ticket for one half of the regular fare, by the same route as that followed on the trip to Des Moines. Certificates may be validated from December 27, 1929, to January 2, 1930. The last date on which return tickets may be purchased is January 6.

Some trouble and perhaps some delay may be avoided if sleeping-car accommodations are reserved upon arrival at Des Moines, before going to hotels or meeting places or to the registration offices in the Shrine Temple. Otherwise it is often convenient to give the validated certificate, with proper instructions for purchasing the return ticket and sleeping-car accommodations, to the porter of your hotel, who attends to these matters for you while you are otherwise engaged. But sufficient time must be allowed.

TRANSPORTATION IN DES MOINES

The Shrine Temple and the hotels that will be used by those attending the meeting are all within easy walking distance of the Rock Island and Union railway stations. The Northwestern station is more distant, about fourteen blocks from the Fort Des Moines Hotel. Directions for reaching the Shrine Temple and the hotels may be had at all railway stations. The taxicab rate in Des Moines is twenty cents for the first quarter mile and ten cents for each additional half mile. No extra charge is made for more than one passenger.

TRANSPORTATION BETWEEN DES MOINES AND AMES

Some of the sessions of the Des Moines meeting are to be held at Ames, the seat of the Iowa State College, which is to act as host for the Ames sessions. The trains of the Chicago and Northwestern Railway Company may be conveniently used for transportation between the two cities. The distance is about thirty-five

miles and the train time is about fifty minutes. An electric line is also available.

HOTEL ACCOMMODATIONS

Information about Des Moines hotels has been published in SCIENCE for November 1, 1929, pages 419–20. The headquarters hotels for the various societies that are to meet with the association this year are shown in an earlier part of this announcement. If hotel reservations have not already been made they should be made at once, by addressing the hotels directly.

All the sessions at Des Moines will be held within walking distance from the hotels; lodgings and session rooms are all to be in the business region of the city and distances will be short this year. Many of the session rooms will be in the headquarters hotels.

Those desiring lodging accommodations outside of hotels should write very soon to Mr. George E. Hamilton, Chamber of Commerce, Des Moines, who will be glad to make reservations in fraternity houses or in other available houses. Prices per day will be from one dollar upwards for these rooms and the number of available rooms will be large.

REGISTRATION AT THE DES MOINES MEETING

The main registration offices for the meeting will be located in the Shrine Temple, on Pleasant St. between Ninth and Tenth Sts. Registration is to be in charge of Mr. Sam Woodley, executive assistant of the American Association. The offices will be open from 9 to 6 daily, throughout the period of the meeting. Registration is necessary in order to secure the official identification card, the official badge, the general program, etc., and in order that railway certificates may be endorsed and validated. All who attend any of the sessions should register as promptly as possible, whether they are members of the association or not, using official registration cards that will be provided.

The registration fee for the Des Moines meeting is to be two dollars, but paid-up members of the American Association for the Advancement of Science may register by paying only one dollar if they show their enrolment cards for 1929–30. Life members of the association may register without paying any registration fee and without showing their cards if they so request, for each registration clerk will be provided with a complete list of life members. But the records of paid-up annual members will not this year be taken to the meeting and paid-up annual members who attend will need their enrolment cards to show that they are enrolled for the current year. Associates for this meeting and personally invited foreign associates may register without paying any registration fee if they show their credentials to the registration clerk. Associates should show their associateship cards and foreign associates should show either their cards or the invitations received from the permanent secretary's office. The registration fees will be applied to help defray some of the costs of the meeting.

Annual members who are in arrears for association dues may pay their arrearages at the registration offices before they register or at the same time. They may then register with payment of the reduced registration fee. Non-members may join the association or may become associates for this meeting by making the proper payments before they register, thus securing the advantage of the reduced registration fee.

To register, fill in the blanks on a registration card and present the card at the registration desk, paying the proper registration fee. The registration clerk will keep the card and will return to you a numbered identification card, which will entitle you to the privileges of the meeting, including the official badge, and a copy of the general program. If you have a railway certificate for validation, leave it at the validation desk, where your identification card will be marked to show that a certificate has been left. (See above, under Transportation to and from Des Moines.) Delegates from institutions and organizations, and all personally invited foreign associates, are specially requested to register as such, noting on their registration cards their exact status in this particular.

ASSOCIATION MEMBERSHIP

The approach of the great annual meeting presents an opportune time for increasing our membership, and all members of the American Association are asked to secure new members or to send to the permanent secretary's office in Washington before December 15 names and addresses of persons who might be interested in joining the association. This request is effective throughout the year, but it is specially desirable that a large number of new members be enrolled before the opening of the meeting.

Copies of a booklet on "The Organization and Work of the American Association," as well as membership application cards and sample copies of the journals, may be secured at any time from the permanent secretary's office. Membership in the association includes a subscription to the weekly journal SCIENCE, or the *Scientific Monthly*, for the calendar year beginning at the close of the annual meeting. The journal alone is worth more than the annual membership dues. Annual members of the association may have both SCIENCE and the *Scientific Monthly* by paying $3.00 in addition to the annual dues ($8.00 in all), if the additional payment accompanies the remittance of annual dues. Annual members of the association may

also subscribe for the *Science News-Letter* at the specially reduced price of $3.00 per year, if the additional remittances accompany their payment of dues in each case. Life members may receive one or both of the extra journals by paying $3 for each subscription.

New members of the association regularly pay an entrance fee of five dollars, but this is now remitted to members of any affiliated organization, including the affiliated state academies. Those who take advantage of this privilege and join at the Des Moines meeting without paying the entrance fee should fill in the blanks on a blue membership application card and present card and dues for 1929–30 ($5.00) when they register. All who attend the Des Moines meeting are asked to join the American Association when they register, unless they are already enrolled.

ASSOCIATES AND FOREIGN ASSOCIATES

Those who are not members of the American Association and who do not wish to join at this time are invited to become associates for this meeting. The associate fee is five dollars. Associates have all the privileges of the meeting, except voting, and they will receive the general reports of the meeting when these are published about February 1. They are to register without paying any registration fee. Associate fees will be used to help defray the costs of the meeting.

Visitors from outside of the United States and Canada who are not members of the association may be invited to the meeting as foreign associates. Members of the association may recommend to the permanent secretary persons who should receive official invitations, giving reasons. Such recommendations should arrive in the permanent secretary's Washington office before December 20, and the present address, as well as the home address, of the recommended person should be given in each instance. Eligibility to this honor is about the same as eligibility to fellowhip in the association.

INFORMATION SERVICE, MAIL, EXPRESS, TELEGRAMS, ETC.

Those in attendance at the Des Moines meeting may obtain information of all sorts by applying at the information desk in the registration offices. Attention is called, however, to the visible directory of those in attendance, from which may be obtained names and both home and Des Moines addresses of those who have registered.

Persons attending the meeting may have mail, etc., addressed to them in care of the American Association for the Advancement of Science, registration office, Shrine Temple, Des Moines, Iowa. They should inspect the personal bulletin every day, which will be conveniently located in the vicinity of the registration desks. If a person's name appears on this bulletin he should inquire at the proper desk for mail, etc. Uncalled-for telegrams will be sent to hotels each afternoon when the registration offices close, unless the person addressed has failed to register and give his hotel address. Unclaimed mail, etc., will be mailed to home addresses after the close of the meeting.

BUSINESS SESSIONS OF THE AMERICAN ASSOCIATION AT DES MOINES

The executive committee of the council is to meet at 10 o'clock on Friday, December 27, in the committee room, Fort Des Moines Hotel, and the council is to hold its first Des Moines session at 2 o'clock on the same afternoon. This council session is to be followed by the Des Moines session of the Academy Conference. Unless otherwise decided, the council will meet at 9 on Saturday, Monday, Tuesday and Wednesday and the executive committee will meet at 10 on the same days. The election of association officers for 1930 is to occur at the council session Tuesday morning. All council sessions will be held in the Green Room of the Fort Des Moines Hotel.

THE SECRETARIES' CONFERENCE AND THE ACADEMY CONFERENCE

The Secretaries' Conference of the American Association plans to hold its Des Moines session on Sunday evening, December 29, at the Fort Des Moines Hotel, following the annual secretaries' dinner. The secretary of this conference is Dr. Philip Fox, secretary of Section D, who has charge of its program. The chairman is Dr. George T. Hargitt, secretary of Section F. This conference consists of the secretaries of the association sections, the secretaries of the associated societies and the members of the executive committee of the association.

The Academy Conference of the American Association is planning to hold its Des Moines session at the close of the council session on Friday afternoon. This conference consists of the council representatives from the affiliated academies and three representatives of the association. The secretary of the conference this year is Dr. D. W. Morehouse, president of Drake University, Des Moines, who is preparing its Des Moines program. Topics of interest to the academies, especially in relation to the work of the association, are to be discussed. The chairman is Dr. Howard E. Enders, of Purdue University, LaFayette, Indiana.

THE SCIENCE EXHIBITION

The general exhibition of apparatus, materials and books for scientific research and science teaching will

be in the Shrine Temple, adjacent to the registration offices for the meeting. The exhibition will be open on Friday evening during the reception and from 9 to 5 on Saturday, Monday, Tuesday and Wednesday. It will furnish a convenient place where one may meet friends and spend a pleasant and profitable hour from time to time. All who attend the Des Moines meeting should be sure to visit the general exhibition.

The exhibition is in charge of Major H. S. Kimberly. Its expenses are met by fees paid by the commercial exhibitors and free space is given for scientific exhibits from investigators and from research and educational institutions. Individual investigators and non-commercial institutions are invited to enter exhibits for the free space. Arrangements should be made at once, by writing to the permanent secretary. All who read this announcement are asked to inform the permanent secretary at once of any individual or non-commercial institutions that might be interested in exhibiting new apparatus, methods, etc. It is desirable that these annual exhibitions should include more non-commercial exhibits than have been entered in the exhibitions of recent years. The aid of association members is specially requested in this connection.

SCIENTIFIC SESSIONS AT DES MOINES

Nearly all fields of science will be represented in the sessions of the sections and their related societies at the eighty-sixth meeting of the American Association. There will be many joint sessions of two or more organizations and many symposia of invited papers on timely topics, as well as a large number of society dinners, luncheons and smokers. A great many sessions will be devoted to the reading of technical contributions. The addresses of the retiring vice-presidents of the association and those of the presidents of the special societies will each be important in indicating the present status and the outlook in each of the several branches. It is, of course, impossible to present the numerous programs of the meeting in this announcement, for which the reader must await the appearance of the society programs and the general program. The latter will be printed in the last two weeks before Christmas, edited for the permanent secretary's office by the program editor, Dr. Sam F. Trelease, of Columbia University. As has been said, the general program will be available at 9 o'clock, December 27, at the registration offices for the meeting, in the Shrine Temple, and copies will be mailed promptly to those who are not going to attend the meeting, if they send in their requests early.

The following pages are devoted to preliminary notes on the special programs of the scientific sessions at Des Moines. These notes have been compiled by the permanent secretary from accounts furnished by the several secretaries of societies and sections, to whom we are greatly indebted for the material presented here. It is, of course, to be remembered that all statements are of a preliminary nature.

These notes on the plans of the many organizations that will take part in the meeting at Des Moines are arranged under headings that correspond to the sections of the American Association. Generally each of the associated and invited societies is related primarily to a single association section, but in some instances the societies can be properly classified only by reference to two sections or to the association as a whole. In connection with these notes see the list of organizations planning to hold sessions at the Des Moines meeting, in an earlier part of this announcement, where the names of the society officers and the dates of the society meetings are shown, as well as their hotel headquarters and most of the places for their meetings.

MATHEMATICS.—The American Mathematical Society and Section A will meet jointly on Monday afternoon, December 30. The retiring vice-president for Section A, Professor R. C. Archibald, of Brown University, will deliver an address on the subject "Mathematics before the Greeks." A second address, entitled "An Unsolved Problem of Uniqueness in Potential Theory," will be given by Professor O. D. Kellogg, of Harvard University, at the invitation of the American Mathematical Society. On Tuesday afternoon there will be a joint session of the American Mathematical Society and the Mathematical Association of America, at which Professor L. L. Dines, of the University of Saskatchewan, will deliver an address entitled "Linear Inequalities and Some Related Properties of Functions." This address is to be given at the joint invitation of the two organizations. On the same afternoon, following the session just referred to, the seventh annual Josiah Willard Gibbs lecture, under the auspices of the American Mathematical Society and the American Association, will be delivered by Professor Irving Fisher, of Yale University, who will speak on "The Application of Mathematics to the Social Sciences." The selection of Professor Fisher as Gibbs lecturer is peculiarly appropriate in view of his having been a colleague of Gibbs; the subject of his address will undoubtedly arouse great interest because of his own brilliant work in the application of mathematics to economics.

On Tuesday morning, December 31, there will be a joint session of the American Mathematical Society, Section K (Social and Economic Sciences) and Section A, for the presentation of short papers dealing with the mathematical-statistical field. Further ses-

sions of the American Mathematical Society for the presentation of papers will be held on Monday and Tuesday mornings. The Mathematical Association of America will hold sessions on Wednesday morning and afternoon with a program of invited speakers. It is expected that the second award of the Chauvenet Prize of one hundred dollars will be made at one of these sessions; this prize is awarded for the best expository paper published in English by a member of the Mathematical Association during the period 1925–28 inclusive. The annual election of officers will also take place on Wednesday. An informal dinner for the mathematical group is scheduled for Tuesday evening.

PHYSICS.—As heretofore, Section B will meet with the American Physical Society and with the American Meteorological Society. The retiring vice-president, Professor P. W. Bridgman, will give an address on "Permanent Elements in the Flux of Present-day Physics." The following statement is a brief indication of its contents:

> A search is made for the elements of permanent significance in our rapidly increasing experimental knowledge and our rapidly changing theoretical outlook, and the endeavor is made to find what the average physicist may best do under the circumstances. The details of most of our mathematical developments are probably transient in character and need not be studied too deeply by the non-specialist, but nevertheless certain broad fundamental principles have been uncovered which probably transcend the mathematics by which they were discovered and of which every one should endeavor to acquire command. Specific suggestions are made as to how to acquire such a command by applying the principles to various elemental situations.

The greater part of the program of the joint meeting will consist of the regular papers contributed to the American Physical Society and the American Meteorological Society. The days for the physical sessions are to be December 30 and 31 and January 1.

The American Meteorological Society will hold its regular meeting Friday and Saturday, December 27–28, at the Fort Des Moines Hotel. Aeronautical meteorology will have a prominent place, occupying one or two half-day sessions. Many practical phases of the subject will be discussed by pilots, air transport officials and meteorologists who have been in close contact with such matters. Radio transmission as related to aviation will also be discussed. In his second presidential address, Dr. W. J. Humphreys, of the U. S. Weather Bureau, will discuss the structure of the atmosphere, its dust content, electrification and limits. Dr. C. C. Wylie, of the State University of Iowa, will discuss recent meteors and what they indicate relative to the limits of the atmosphere. T. A. Blair will discuss seasonal pressure changes to the west, as related to winter weather in the Missouri and Mississippi Valleys. A half-day session will be devoted to the work of cooperative observers and ways to encourage and interest them. This meeting will occur in one of the most important agricultural regions and considerable attention will be given to some phases of agricultural meteorology.

CHEMISTRY.—Section C plans to hold sessions at Des Moines on Friday and at Ames on Saturday, arranged with the cooperation of the midwest regional group of the American Chemical Society and the Iowa State College section of that society. The most prominent part of the program is to be a symposium on "Chemical Utilization of Agricultural Products." The retiring vice-presidential address for Section C will be given Saturday morning, by Dr. C. E. K. Mees, of the Eastman Kodak Company. The session at Ames will include an inspection of the very interesting experimental plant for making paper from corn-stalks, located on the campus of Iowa State College. This plant is supported partly by the state and partly by the U. S. Bureau of Standards. It will be in operation, making corn-stalk wallboard.

ASTRONOMY.—Section D (Astronomy) will hold sessions at the Fort Des Moines Hotel on Monday, and at the University and City Observatory on Tuesday afternoon. Through the courtesy of President D. W. Morehouse, of Drake University, transportation to the observatory will be provided, and opportunity will be given for an inspection of its equipment. It is planned that one of the sessions shall be in conjunction with Section L. At the Tuesday afternoon session, Dr. J. S. Plaskett, vice-president and chairman of Section D, will give his retiring address on "Motions of the B-type Stars." Other addresses to be given at Des Moines will be by Professor Edwin B. Frost, on "Some Aspects of Celestial Evolution," and by Professor Philip Fox on "The Adler Planetarium and Astronomical Museum of Chicago." Both these lectures will be illustrated with lantern slides.

GEOLOGY AND GEOGRAPHY.—Section E will hold sessions for the reading of papers on Monday and Tuesday, December 30 and 31. The address of the retiring vice-president for Section E, Professor Frank Leverett, of the University of Michigan, will be given at 4 o'clock on Monday, on "Problems of the Upper Ohio Drainage." There will be a dinner for geologists and geographers on either Monday or Tuesday evening. Des Moines is at the center of the classic area for the study of the glacial deposits of the Mississippi Valley, and it is expected that several papers dealing with Pleistocene problems will be presented. A joint session of Section E with Part 1 (History

of Science) of Section L is being planned. The general session Tuesday evening will be devoted to a non-technical address on some interesting social and economic relations of the Pleistocene geology of Iowa and adjacent states, by Dean George F. Kay, of the University of Iowa. Other papers will consider the stratigraphy of the Mississippi Valley, and still others will deal with general geological problems.

ZOOLOGICAL SCIENCES.—Section F and the American Society of Zoologists will hold joint sessions for reading of papers on Monday, Tuesday and Wednesday, December 30 and 31 and January 1. Following the practice of recent years, morning sessions will be devoted to the formal reading of papers and afternoon sessions to informal demonstration presentations; those presenting papers may choose whichever method best suits their material. Contributed papers from the section will appear in the program of the American Society of Zoologists, Section F holding no separate sessions for contributions. An announcement regarding the plans for Section F appeared in SCIENCE for August 23. The business session of the section is to precede the business session of the Society of Zoologists on Tuesday afternoon. The address of the retiring vice-president for Section F, Dr. M. F. Guyer, will be delivered immediately following the zoologists' dinner on Tuesday evening. Dr. Guyer's title is "The Germinal Background of Somatic Acquirements." The biologists' smoker will occur on Monday evening.

This will be the twenty-seventh meeting of the American Society of Zoologists, under the presidency of Dr. C. B. Davenport, of the Station for Experimental Evolution, Cold Spring Harbor, New York. Joint sessions with other societies are planned: with the American Society of Parasitologists Monday morning and with the Ecological Society of America Tuesday morning. The retiring address of President Davenport, on "Light Thrown on Evolution by Genetics," will be given as the closing event of the Wednesday morning session.

The Entomological Society of America will hold its twenty-fourth annual meeting from December 28 to 30 under the presidency of Dr. C. T. Brues, of the Bussey Institution, Harvard University. The Saturday morning session will open with the introductory business and reading of papers. The Saturday afternoon session will include a symposium entitled "Important Contributions which America Has Made to the Study of Insects." A trip to the Iowa State College, at Ames, to inspect the biological laboratories is planned for Sunday, December 29. The program will be continued Monday morning and afternoon. Monday evening the annual public address will be given by Dr. W. M. Mann, director of the National Zoological Park. The annual entomologists' dinner will be held Tuesday evening.

The American Association of Economic Entomologists will hold its forty-second annual meeting from December 30 to January 2, Monday to Thursday. The Monday sessions will be devoted to the section of Plant Quarantine in the morning and afternoon and to the Extension Entomologists and Insect Pest Survey in the afternoon. On Tuesday will occur the opening business session of the General Association and the address of the president, T. J. Headlee, of the New Jersey Agricultural Experiment Station. The general association will continue its sessions through Wednesday and that portion of Thursday which will be needed. The section of Apiculture is scheduled to meet Wednesday afternoon. The entomologists' dinner will be held Tuesday evening. The program of the general association will include, among others, papers on the artificial and natural control of insect pests. By special invitation, entomologists are to visit the department of entomology of Iowa State College, at Ames, on Sunday, December 29. It will be well worth while for all entomologists attending the meeting to arrange to take advantage of this invitation.

The American Society of Parasitologists will hold its fifth annual meeting from December 27 to 31. A special feature of this meeting will be a symposium on the parasites of live-stock, including a moving picture film of the life cycle of the sheep liver fluke. The address of the retiring president, Dr. N. A. Cobb, will be entitled "Recent Aspects of Nematology." The luncheon and business meeting of the society will be held Sunday afternoon in the headquarters hotel. As has been customary for the last few years a joint session will be held with the American Society of Zoologists. Since the society is particularly strong in the Middle West a large attendance is expected. The indications are that there will be an unusually interesting series of programs of contributed papers.

The Wilson Ornithological Club has been fortunate in arranging a particularly interesting program for the Des Moines meeting, December 27 and 28, consisting of a wide variety of papers on bird life, with special reference to the Central States. Especially interesting will be motion pictures to be shown at the Friday afternoon session. Among these will be Dr. Gromme's excellent films.

BOTANICAL SCIENCES.—On Tuesday afternoon, December 31, Section G will hold a joint session with the associated botanical societies. Professor C. E. Allen, of the University of Wisconsin, retiring vice-president for the section, will deliver an address on "Inheritance in a Hepatic." This address will be followed by a symposium on botanical problems of

the corn plant, at which G. N. Collins, Paul Weatherwax, E. W. Lindstrom and others will speak. See also Agriculture, below, for announcement of a program on recent investigation on maize.

The Botanical Society of America will meet on Monday, Tuesday and Wednesday. The president for the meeting is Dr. Margaret C. Ferguson, of Wellesley College. Business sessions will be held each morning at 9, followed, at 10, by sessions of the five sections of the society. In the afternoons, joint sessions will be held with Section G of the American Association, the Ecological Society of America and the American Society of Naturalists. The General Section will probably hold a round-table discussion on the teaching of botany. The annual dinner for all botanists will be held Tuesday evening. At this time, Dr. A. H. R. Buller, of the University of Manitoba, will deliver the retiring presidential address. The section programs will be representative of their special fields and all branches of botany will be dealt with by papers to be presented at this meeting.

The American Phytopathological Society will meet during the period Saturday, December 28, to Tuesday, December 31, sessions being held in the Grant Club, which is conveniently located with reference to the Chamberlain Hotel, headquarters for the botanical groups. The president for the meeting is R. J. Haskell, of the U. S. Department of Agriculture. Numerous interesting and important papers will be presented. Joint sessions with other organizations are planned as follows: (1) on Monday afternoon an important program devoted to papers on virus diseases of plants and animals, with the Society of American Bacteriologists; and (2) with Section G on Tuesday afternoon, the papers being on topics of general interest. There will also be a round-table discussion Tuesday afternoon on extension work in plant pathology. The annual dinner of the Phytopathological Society is scheduled for Saturday evening. Much time has been spent by members of the dinner program committee in the arrangement of an unusual entertainment to follow the dinner. Tickets may be secured in advance (before Saturday noon) at the general registration offices for the meeting. The opening session will start at 10 on Saturday, with a session for contributions followed by a business session. A most interesting program is being planned for an informal supper for plant pathologists on Sunday evening. The Monday session will be held at the Iowa State College, at Ames, where I. E. Melhus, professor of plant pathology, and his associates will be hosts. Transportation from the hotel in Des Moines to the State College has been arranged. Two or more simultaneous sessions will be held during the morning, while the afternoon will be devoted to the above-mentioned joint session on virus diseases. An important feature of the day at Ames will be a greenhouse virus-disease exhibit, for which months of preparation have been necessary. One of the high points of this meeting on Monday will be a luncheon served at Memorial Union Hall, Iowa State College.

The sixth annual meeting of the American Society of Plant Physiologists will be held December 30 to January 1. The president for this meeting is Dr. Scott V. Eaton, of the University of Chicago. The program will contain contributions in many of the different fields of plant physiology. A joint session will be held Tuesday morning with the American Society for Horticultural Science. At the annual dinner for all plant physiologists announcement will be made of the award of the first Stephen Hales Prize, recently established by the Society of Plant Physiologists through an endowment raised by subscription.

BIOLOGICAL PROGRAMS RELATED TO BOTH ZOOLOGY AND BOTANY.—The Des Moines meeting of the American Society of Naturalists will, as usual, include an afternoon symposium followed by the annual business meeting. The symposium this year is to be on "Radiation and Life," different phases of the subject being discussed by Professor Selig Hecht, Dr. R. A. Emerson and others. In the evening will occur the annual dinner, at which President George H. Parker will give his retiring presidential address.

The Ecological Society of America is to meet on Monday, Tuesday, Wednesday and Thursday. It is probable that the dinner and perhaps one or two other sessions may be held at Iowa State College, Ames. The president this year is W. C. Allee, of the University of Chicago. Joint sessions with other organizations are planned as follows: (1) with the Botanical Society of America, Monday afternoon; (2) with the American Society of Zoologists, Wednesday afternoon. Symposia, or less formal groups of papers and discussions, devoted to the following general subjects, are planned: "Hydrogen Ion Concentration," in charge of President Allee; "Range Ecology," in charge of Dr. Herbert C. Hanson, of Colorado Agricultural College; "Environmental Units and their Terminology," in charge of W. E. Allen, Scripps Institution for Oceanography. Several sessions will be devoted to papers of general ecological interest and to the business. The annual dinner is planned for Wednesday evening, probably at Ames; definite announcement will be made later.

The Genetics Sections of the American Society of Zoologists and the Botanical Society of America will hold regular sessions for the reading of papers on Monday, Tuesday and Wednesday mornings. There will be a short business session, for the election of

officers and to receive the report of a committee appointed to consider "what organization is for the best interests of genetics in America." On Tuesday and Wednesday afternoons there will be informal laboratory demonstrations and exhibits. An excursion to the Iowa State College of Agriculture and Mechanic Arts, at Ames, is being planned for Sunday, and the Monday morning program, of botanical papers in genetics, will be held at Ames. On Monday afternoon the Genetics Sections will join at Ames with the Geneticists Interested in Agriculture, in a symposium on "Genetic Experimentation with the Larger Domesticated Mammals."

The American Microscopical Society will hold its annual business meeting and election of officers on Tuesday afternoon, December 31, at 4:30. The national council of the Phi Sigma Biological Society will hold its meetings on Friday and Saturday, December 27 and 28, at the Fort Des Moines Hotel.

The BBB Honorary Biological Fraternity is to hold a breakfast Sunday at 10 o'clock and other sessions on Monday and Tuesday at 3. Its headquarters are to be in the Savery Hotel.

ANTHROPOLOGY.—The meetings of Section H will be on December 30 and 31. One or more sessions will be held in conjunction with the newly organized American Association of Physical Anthropologists, and a very interesting program in this field is anticipated. In accordance with the policy advocated by the executive committee, special provision is being made for the exhibition of specimens and the demonstration of instruments and methods. This mid-western meeting of Section H and the associated organizations will afford specially favorable opportunities for free discussion of anthropological problems relating to this particular section of the country. Arrangements for the annual dinner of anthropologists and other special features will be announced later.

PSYCHOLOGY.—Section I will hold its meetings on Friday and Saturday, December 27 and 28. The vice-president of the section is Professor Madison Bentley, of Cornell University. On the morning of December 27 a joint session, with invited speakers, will be held with Section Q (Education). In the afternoon another joint session with Section Q will be held for the presentation of the addresses of the retiring vice-presidents of these sections, Professor Howard C. Warren, of Princeton University, for Section I, and Professor Truman L. Kelley, of Stanford University, for Section Q. On Saturday, December 28, the sessions will be devoted to contributions by members of Section I. Apparatus and material for psychology is to be displayed in the general exhibition, and those who plan to bring exhibits to this meeting should inform the secretary of Section I at once so that arrangements may be made for the needed space.

SOCIAL AND ECONOMIC SCIENCES.—Section K will hold sessions on Saturday, Monday and Tuesday. The vice-president for the meeting is H. L. Rietz (University of Iowa), and the secretary is C. F. Roos (Cornell University). A joint session with Section A and the American Mathematical Society will occur Tuesday morning, the program being devoted to mathematical papers on statistics, economics and sociology. With Section M (Engineering) a joint session will occur Saturday morning, the program being a series of invitation addresses dealing with economic and statistical aspects of engineering; at this session will be given an address by Dr. W. A. Shewhart, of the Bell Telephone Laboratories, on "Quality Control of the Manufactured Article." The Monday sessions will be devoted partly to contributions and partly to invitation papers, dealing with statistics, economics and sociology. About a dozen of America's leading economists, statisticians and sociologists, including H. L. Rietz, E. B. Wilson, Henry Schultz, H. Hotelling, C. C. Zimmerman, J. E. Brindley, E. B. Reuter, G. D. Stoddard, P. A. Sorokin, G. R. Davies, C. I. Bray and C. F. Roos have already indicated that they will contribute to this program.

Those who are interested in social and economic sciences should not fail to note that the Josiah Willard Gibbs lecture, which is regularly provided by the American Mathematical Society and presented at a general session of the American Association, is this year to be given by Irving Fisher, of Yale University, who will discuss applications of mathematics in the social sciences. This lecture will be given on Tuesday afternoon at 4:30.

The Metric Association will present a program dealing with standardization on an international basis as the main feature of the annual meeting this year. Educational authorities, representatives of local industries and other business men and women are to participate. It is hoped that European and South American countries will be represented. A morning session will be followed by a "Weight and Measure" luncheon and an afternoon session, and the meeting will close with the annual "Metric" dinner. Among the speakers will be Arthur Bessey Smith, of the Automatic Electric Company, and Dayton C. Miller, of the Case School of Applied Science. Metric standardization has made such enormous strides during the past year that this will probably be one of the best meetings held by the Metric Association. All who are interested in the metric system in any way are cordially urged to attend and to take part in the discussions. Inquiries regarding the Des Moines meet-

ing should be addressed to the Metric Association, 156 Fifth Avenue, New York City.

HISTORICAL AND PHILOLOGICAL SCIENCES.—Section L now operates in two parts, Part 1 for the History of Science, and Part 2 for the linguistic sciences. A short program for Part 2 is being arranged. The Linguistic Society of America will hold its regular annual meeting at Cleveland, from December 30 to January 1. Historical sciences will be well represented at Des Moines. At least three sessions on the history of science are being planned by Dr. Joseph Mayer, secretary of Part 1 of Section L. An interesting series of timely papers will be presented, including especially papers of peculiar interest in the Middle West. A number of outstanding scholars have already been secured to make an important and colorful program in this important field of science. Among the topics will be: "Science and Literature of History," "Medieval Scientific Thought," "Making the Archives of a State available for Scholars," "Preserving the Indian Lore of the Mississippi Valley," "The Evolution of Agricultural Thought in the United States." A joint session by Section E (Geology and Geography) and Part 1 of Section L is being planned. An address by Dean George F. Kay, of the University of Iowa, on the relation of glaciation to the development of human culture in the Iowa region will be interesting to those who attend the sessions on the history of science. Dean Kay's address is to be given at the general session Tuesday evening.

ENGINEERING.—A joint session of Section M (Engineering) and Section K (Social and Economic Sciences) is planned for Saturday morning, December 28. This session will be devoted to a symposium on the use of statistics in engineering. There are to be two sessions on Monday. At one of these will be given the retiring vice-presidential address of R. L. Sackett, on "The Parallel Development of Science and Engineering." Among others there will be papers on the significance of the mapping program of the federal government, terrestrial magnetism and some recent practical applications and other subjects. An engineering luncheon is planned for Monday. At another session on Monday will be presented a program arranged by the engineering organization of Iowa. Some of the topics for this program are: "Application of Engineering to the Farm," "Elimination of Waste on the Farm," "Comparison between the Agricultural Problems of the United States of America and Those of the Union of Socialistic Soviet Republics," "Highway Department" and "Progress in Ceramics."

MEDICAL SCIENCES.—Section N is to meet on Tuesday, December 31, for a morning and an afternoon session in affiliation with the American Veterinary Society, under whose auspices the program for these sessions is being arranged. Having in mind the increasing importance of animal diseases as a menace to the human family, the program will include much of the newer work in medical and veterinary parasitology, serum therapy of experimental pneumococcus and streptococcus meningitis, undulant fever, and other fields of similar interest. The subjects for discussion will not only be of interest to the medical profession and scientists, but should particularly appeal to the general public. The section program on Wednesday, January 1, will present reports on some of the newer researches which are doing so much to clarify medical problems, particularly in the fields of bacteriology and serology. At this session will be presented the annual vice-presidential address, by Dr. A. J. Goldforb, of the College of the City of New York, who will speak on "Medical Science." A joint session is to be held with the Iowa State Medical Association.

A public meeting of the section is planned in the afternoon to discuss questions of policy and plans. All who are interested in Section N are invited to attend this business session and take part in the discussions.

AGRICULTURE.—Section O will hold morning and afternoon sessions on Saturday, with the American Society of Agronomy, the program being a symposium on "Corn Research," arranged by Professor John B. Wentz, of Iowa State College. The invitation papers will cover many phases of recent investigation on maize. (See also Botanical Sciences, above, for announcement of a symposium on botanical problems of the corn plant.) An agriculture dinner will occur Saturday evening, at which time Director C. A. Mooers, of the University of Tennessee, will deliver the address of the retiring vice-president of Section O.

The American Society for Horticultural Science will hold its twenty-sixth annual meeting on Monday, Tuesday and Wednesday, December 30 and 31 and January 1. The annual horticulturists' dinner will occur on Tuesday evening, at which the address of the retiring president will be given by V. R. Gardner, of Michigan State College and director of the Michigan Experiment Station. Over ninety papers have been received for presentation, representing an unusually wide interest in many different phases of horticulture. There will be a joint session with the American Society of Plant Physiologists, probably Wednesday forenoon, and the election of officers is scheduled for the afternoon of that date.

The Society of American Foresters will meet Monday and Tuesday, December 30 and 31. Arrangements for the meeting are in the hands of the program committee, of which Carlile P. Winslow, director of the Forest Products Laboratory, is chairman. Paul

Redington, chief of the U. S. Biological Survey and president of the society, will give the opening address. This will be followed by a discussion of a national forest policy. A committee appointed by the society a year ago to study this question will present its report. This committee, headed by Barrington Moore, editor of *Ecology*, and composed of prominent foresters from all sections of the United States, will present recommendations that will be of national interest. Various phases of the forest problem—social, economic and industrial—will be discussed. The morning of the second day will be devoted to the presentation and discussion of technical subjects in silviculture, biochemistry, ecology, soils, forest utilization and other branches. The afternoon will be given over to reports of standing committees, one of the most important of which is the committee on forest education, headed by Colonel H. S. Graves, dean of the Yale Forest School. Officers' reports, resolutions and society business will follow.

The annual meeting of the Association of Official Seed Analysts of North America will be held December 31 and January 1 and 2. The program will be occupied largely with round-table discussions based on the work of the standing committees. The report of the legislative committee will be supplemented by an invitation paper on "Seed Law Enforcement," by H. R. Kraybill, state chemist and seed commissioner of Indiana. As a leading feature of the meeting, there has been planned a demonstration of comparative germination tests in soil and in an artificial substratum to serve as a basis for discussion of a more uniform interpretation of germination tests. There also will be papers reporting the results of investigations of problems relating to seeds.

The Potato Association of America will hold its sixteenth annual meeting December 30 and 31 and January 1. A special feature of the meeting will be a résumé of work done in the United States and other countries in the development of potato varieties from seedlings. A special exhibit of potato seedlings that show considerable merit will be on display at the meeting. Several papers will be presented by prominent physicians and dietitians on the value of the potato as an article of diet, also papers dealing with recent developments in cultural experiments, disease control and storage investigations.

The Geneticists Interested in Agriculture will meet Monday afternoon with the Genetics Sections and Section O, in a symposium on "Genetic Experimentation with the Larger Domesticated Mammals." Papers will be read by J. L. Lush, of the Texas Agricultural and Mechanical College, and by E. N. Wentworth, of Armour's Livestock Bureau.

The Crop Protection Institute will hold its annual dinner at 6:30 on Monday, December 30, in Yunker's Tea Room.

EDUCATION.—Seven sessions of Section Q are planned for Thursday, Friday and Saturday. The vice-president for this meeting is Dr. F. N. Freeman, of the University of Chicago. A joint dinner of the section and the Society of Phi Delta Kappa is planned for Thursday evening. A brief program will follow the dinner. Joint sessions will be held with Section I (Psychology) Friday forenoon and Friday afternoon. At the afternoon session the retiring vice-presidents of Sections I and Q, Dr. H. C. Warren (of Princeton University) and Dr. Truman Kelley (of Stanford University), will present addresses. The topics for the other sessions are: "Research in Elementary Education," Thursday morning; "Research in Secondary and Collegiate Education," Thursday afternoon; "Investigations in the Teaching of Science," Saturday morning.

PROGRAMS RELATED TO SCIENCE IN GENERAL.—The Society of the Sigma Xi is to meet with the association at Des Moines, but information concerning the prospective program has not come to the permanent secretary. The eighth annual Sigma Xi lecture will be given at the general session on Saturday evening, December 28. This lecture is always arranged by the society and is given on the second evening of the meeting. This year it is to be given by Dr. George H. Parker, of Harvard University, on the subject "What are We About?" The lecture will deal with the present situation in science.

The Honor Society of Phi Kappa Phi will hold its eleventh biennial convention December 31. At the morning session will be given an address by a speaker whose name will be announced later. The Education dinner will occur on Tuesday evening.

The Gamma Alpha Fraternity will meet Monday afternoon, and a fraternity breakfast will occur Tuesday morning.

The American Nature-Study Society is to meet on Friday and Saturday, December 27 and 28. The program will include addresses and discussions on nature-study problems of various kinds, especially that of nature education, and the annual dinner of the society and affiliated organizations will occur Saturday evening.

Sigma Delta Epsilon, Graduate Women's Scientific Organization, will have two breakfast meetings, the first, on December 30, will be for all women visitors, while the second, on December 31, will be specially for members of the organization. This society has expanded greatly since its establishment in 1921 and now has eleven chapters. The national president is Dr. Stella M. Hague, of the University of Illinois.

OBITUARY

HENRY DAGGETT HOOKER, JR.

Dr. H. D. HOOKER, associate professor of horticulture at the University of Missouri, was accidentally killed on October 26, 1929, at the age of thirty-seven years.

He was born in Brooklyn, N. Y., in 1892. At the age of twenty he received the A.B. degree from Yale University. Enjoying a travelling fellowship from his Alma Mater he spent the next year under Ludwig Jost, the well-known teacher of plant physiology, at Strasburg, Germany. Upon his return from abroad he obtained his A.M. degree; and, while serving for two years as assistant in botany, he completed his training for the Ph.D. degree in plant physiology and physiological chemistry under Dr. L. B. Mendel in 1915. During the following three years Dr. Hooker was instructor of botany at Yale, which position terminated by his entrance into war service, first as assistant physiologist in gas defence organization of the U. S. Bureau of Mines, and later as lieutenant in Chemical Warfare Service. In 1919 he was appointed assistant professor in horticulture at the University of Missouri and made an associate in 1920.

Dr. Hooker came from an old New England family, was of slender build, fair and with prominent intellectual features. Putting to good advantage his ability and training, he concentrated his activities on plant physiological and biochemical investigations in the field of horticulture. His contributions on hardiness, nitrogen fertilization, fruit-bud formation, carbohydrate metabolism and biennial bearing have brought him renown both in this country and abroad. Whatever he undertook was logically planned and well done.

Being scholarly predisposed by training and inclination, Dr. Hooker probably displayed his greatest efforts in reviewing and summarizing the contributions of other investigators in plant physiology and horticulture. He was a master in abstracting technical papers and translating their contents into plain, clear and pointed language. His several review articles and two books, prepared in collaboration with V. R. Gardner and F. C. Bradford, give full testimony of this ability. Hooker's premature death has been a great loss to horticultural science in America.

A. E. MURNEEK

RECENT DEATHS

DR. VICTOR CLARENCE VAUGHAN, who retired as dean of the Medical School of the University of Michigan in 1921, died on November 21 at the age of seventy-eight years.

HENRY NEHRLING, collaborator in the bureau of plant industry of the U. S. Department of Agriculture, known for his work in horticulture and ornithology, died on November 22 at the age of seventy-six years.

MISS SARAH E. SMITH, since 1928 professor emeritus of mathematics at Mount Holyoke College, died on November 18, in Madura, India. At the time of her death she was on her way to Madras, where she expected to spend some weeks at the Women's Christian College.

DR. RUDOLPH O. BORN, professor emeritus of diseases of the eye, in the Polyclinic Hospital, New York City, died on November 17.

DR. JAIME FERRAN, Spanish bacteriologist, died in Barcelona on November 23. He was seventy-seven years old. Dr. Ferran is known for the development of an anti-cholero serum for which he received recognition from the Academy at Paris.

SCIENTIFIC EVENTS

EXPLORATIONS IN CHINA

TERMS even more stringent than those rejected last June by Dr. Roy Chapman Andrews and the American Museum of Natural History for the proposed expedition into Mongolia have been accepted, according to a correspondent of the New York *Times*, by a French scientific expedition which is to explore Western China from Sinkiang (Chinese Turkestan) on the north to Annam and French Indo-China on the south. According to an agreement officially announced from Nanking, the proposed expedition will leave Peking for Sinkiang in January next and is to complete its work within one year. Its object is announced as "researches in geography, geology, biology, anthropology, archeology and sociology." Both the French and Chinese members are to hold their appointments from the Chinese National Association of Cultural Societies, and there are to be French and Chinese co-directors, the latter of whom will handle all negotiations with local authorities. A representative of the Nanking chief of staff department will be with the party and have power to stop any moves or activities "injurious to the national defense plans of the government." The Chinese Cultural Association will pay the expenses of the Chinese members from Peking to Sinkiang and from Annam back to Peking, but all

other expenses must be borne by France. The regulations accepted by the French specify that the "expedition must not destroy nor partially destroy any structures which are of historical or of archeological importance," and that no French members must buy antiques or curios for their private collections. All archeological specimens of interest are to become the property of the Chinese Cultural Association, as are all specimens found which are of geological or biological interest. The Chinese Cultural Association, at its discretion, may present duplicates of the latter to France. All photographs, motion pictures and notes which the French members of the expedition may accumulate on the journey are to be given over to the Chinese Cultural Association, which may or may not release any or all of them after an examination, which must be completed within six months after the expedition returns to Peking.

CANCER RESEARCH IN ENGLAND

THE grand council of the British Empire Cancer Campaign, at a meeting on October 14, renewed the grant to the Cancer Hospital (Free) for the special scheme of radiological research which is being carried out upon the effects of X-rays upon the blood constituents and bone marrow. This work is a comprehensive scheme of research approved of by the campaign three years ago, and is carried out jointly by research workers and clinical workers, with the object of correlating the findings of experimental work with those observed in the treatment of patients suffering from cancer. A further grant of £250 for one year was also made to Mr. E. Nevill Willmer for the continuation of his research work on the relation of the chemical nature of the media in which cultures grow to the growth of the cultures. Mr. Willmer formerly carried out his research work at the Victoria University of Manchester, but has now been appointed lecturer in the physiological department of the University of Cambridge. A report from the finance committee by Sir Richard Garton showed that grants made by the campaign during the last year for research purposes amounted to approximately £25,000, while donations received during that period amounted only to approximately £17,000. The finance committee asked grand council that special efforts should be made during the ensuing year to increase the donations to the campaign in order that it may be able to subsidize the work of the cancer research centers at their maximum activity. The general secretary reported that details of the policy which the National Radium Commission proposed to adopt, relative to the coordination of existing bodies interested in the use of radium, had not been so far communicated to this campaign. The grand council expressed a hope that early steps would be taken to bring about coordination between the work of the National Radium Commission, the use of the radium in the hands of King Edward's Hospital Fund and the various radium centers in existence which have been formed by the British Empire Cancer Campaign.

FOREST EDUCATION

A GRANT of $30,000 has been made by the Carnegie Corporation of New York City to the Society of American Foresters for a forest education inquiry. The responsibility for the inquiry, which will require two years to complete, according to the announcement, has been delegated to a staff of four. Henry S. Graves, dean of the Yale School of Forestry, will serve as director; C. H. Guise, assistant professor of forest management at Cornell University, has been appointed assistant director; George A. Works, president of the Connecticut Agricultural College, will act as adviser in the field of education, and E. J. Kraus, professor of botany in the University of Chicago, will be adviser in the general field of science. A special committee of the Society of American Foresters will assist in the inquiry. This committee, which later may be enlarged, consists of Robert Y. Stuart, Chief Forester, United States Forest Service, chairman; Irving W. Bailey, professor of plant anatomy, Harvard University; Earl H. Clapp, chief of the branch of research, United States Forest Service; Livingston Farrand, president of Cornell University; Henry S. Graves, dean of the Yale School of Forestry; William B. Greeley, secretary and manager, West Coast Lumberman's Association; Lewis R. Jones, professor of plant pathology, University of Wisconsin; Raymond E. Marsh, secretary of the Society of American Foresters; David T. Mason, consulting forester; Barrington Moore, editor of *Ecology;* Charles Lathrop Pack, president of the American Tree Association; W. A. Pickering, Pickering Lumbering Company; John F. Preston, Hammermill Paper Company; Paul Redington, president of the Society of American Foresters; R. B. Robertson, United States Forest Service, and E. O. Siecke, state forester of Texas.

THE FIFTIETH ANNIVERSARY OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

THE fiftieth anniversary of The American Society of Mechanical Engineers, to be celebrated in April, 1930, in Washington, Hoboken and New York, will mark not only a half century of growth of this organization, but will commemorate its progress by bringing together the leading engineers of the world.

In New York, the delegates, members, and guests will register at the United Engineering Societies Building, on Saturday, April 4 and 5, when creden-

tials will be presented. This will be followed by the unveiling of a tablet in the lobby of the building, commemorative of the anniversary, and then the party will be taken to the offices of *The American Machinist*, where a program will be given depicting the preliminary meeting held so many years ago.

This preliminary conference was summoned by Prof. John E. Sweet, at the publication's office at 96 Fulton Street, New York, on February 16, 1880. Alexander L. Holley was nominated for chairman, and his opening address on the "Field of Mechanical Engineering" covered his conception of it and the type of man from which such a society, if organized, might draw its membership. The first step was to appoint a committee to draw up the basis of organization and formulate its rules; this was done by making Messrs. Henry R. Worthington, Eckely B. Coxe, Jackson Bailey, Gen. Quincy A. Gillmore, Prof. W. P. Trowbridge, M. N. Forney, and A. L. Holley such a committee.

The anniversary program will be continued at Stevens Institute, at Hoboken, N. J., commemorating the organization meeting in the auditorium of the institute with a pageant. There will be a welcoming dinner under the auspices of the Metropolitan Section of The American Society of Mechanical Engineers. On Sunday the party will entrain for Washington, D. C. On Monday morning, an address will be made by a representative of the Government and by the president of The American Society of Mechanical Engineers. Presentation of greetings and two-minute addresses will be made by a delegate from each country. They will be followed by brief addresses by the presidents of The American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, The American Institute of Electrical Engineers, and the Society for the Promotion of Engineering Education.

In the afternoon there will be a session on "The Influence of Engineering upon Civilization," when seven of the sixteen national papers covering the humanistic aspects of engineering will be summarized by their authors in short addresses. This will be followed by a reception at the White House, while in the evening a reception will be given by the officers and council of the American Society of Mechanical Engineers.

On Tuesday the second part of the session on "The Influence of Engineering upon Civilization" will be held, when the remaining nine national monographs will be presented, and an address summarizing the book to be published on "Fifty Years of Mechanical Engineering in the United States." At noon on Tuesday will be held a luncheon in honor of the founders of the society, and this will be followed by the ceremonies attendant upon the conferring of honorary membership in the society and the presentation of medals.

SCIENTIFIC NOTES AND NEWS

AT the annual dinner, as announced last week, of the Chamber of Commerce of the State of New York, on November 21, a portrait was unveiled of Mr. Thomas A. Edison, who has been an honorary member of the chamber for forty years. Mr. Leonor F. Loree, president of the chamber, also paid tribute to eight others who have performed services for the city, including Dr. Henry Fairfield Osborn, president of the American Museum of Natural History, and Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research.

THE graduates of the school of medicine of the University of Michigan will on December 9 present to the university a portrait of Dr. Frederick G. Novy, professor of bacteriology and director of the hygienic laboratory. On December 9 Dr. Novy will be sixty-five years of age. Forty-three of those years he has spent as a member of the faculty of the school of medicine. The ceremony on the afternoon of December 9 will be conducted in the Lydia Mendelsohn Theater of the Michigan League. Dr. Alexander G. Ruthven, president of the university, will accept the gift for the university. The portrait has been painted by John Weiss, of Cincinnati.

THE Dutch Entomological Society has elected as honorary members, in place of Chr. Aurivillius, of Sweden, and Th. Becker, of Germany, both deceased, Dr. Geza Horvath, of Budapest, and Dr. L. O. Howard, of Washington.

THE New York Zoological Society, through its president, Mr. Madison Grant, presented on November 8 a gold medal to Mr. William Beebe in recognition of thirty years of service.

THE College of Physicians of Philadelphia has awarded the Alvarenga Prize for 1929 to Dr. George M. Dorrance, Philadelphia, for an essay entitled "Congenital Insufficiency of the Palate."

DR. AMANDA T. NORRIS, who has been practicing medicine for fifty years in Baltimore, was tendered a dinner by the Women's Medical Society of Maryland on November 9, when the society celebrated its fifteenth anniversary. Dr. William H. Welch was the principal speaker. Dr. Howard A. Kelly gave a his-

tory of women in medicine; Dr. Patience S. Bourdeau Sisco, a sketch of the local society, and Dr. Louise Taylor Jones, Washington, spoke on the International Association of Medical Women.

THE gold medal of the Radiological Society of North America has been awarded to Dr. Joseph Colt Bloodgood, clinical professor of surgery of the Johns Hopkins University, and Dr. Russell L. Haden, of Kansas City. The presentation will be made at the society's fifteenth annual meeting in Toronto, opening on December 2. Dr. Bloodgood is given the award for his work in the study of bone malignancy, its diagnosis and treatment by means of X-ray and radium, and Dr. Haden for his research work in X-ray study of dental infection.

THE Manly Medal for achievement in aeronautical engineering has been awarded to Samuel D. Heron, power-plant engineer of the material division of the air corps at Wright Field, Dayton, Ohio. The medal is bestowed upon the person considered to have made the most important contribution during the year to aeronautical engine development. The award is named in honor of Charles M. Manly, chief engineer for Samuel P. Langley in the design and building of his radial engine for the early Langley monoplane.

AT the recent annual meeting of the Association of American Medical Colleges in New York, Dr. William Darrach, of Columbia University, New York, was made president; Dr. Maurice H. Rees, University of Colorado School of Medicine, Denver, vice-president; and Dr. Fred C. Zapffe, Chicago, secretary. The next annual meeting will be in Denver, from October 14 to 16, 1930.

HONORARY fellowships of the Ross Institute, London, have been conferred on Colonel Walter G. King and Dr. W. M. W. Haffkine. Colonel King was sanitary commissioner to the Government of Madras, 1894–05, and for the Government of Burma, 1906–08. While he was engaged on vaccine investigations, the Government of Madras established the King Institute of Preventive Medicine. Dr. Haffkine worked at the Institute Pasteur (as assistant to Pasteur) 1889–1893; and when he had found a vaccine for cholera, he went to India to try it, and was employed by the Indian Government. He founded the Government Research Laboratory, now the Haffkine Institute, at Bombay.

THE Clerk Maxwell Scholarship of the University of Cambridge for the advancement of original research in experimental physics, and especially in electricity, magnetism and heat, which is awarded once in three years and is of the value of £210 a year for three years, has been divided equally between William Heriot Watson, research student, Gonville and Caius College, and William L. Webster, Ph.D., Trinity College.

A. NELSON SAYRE has been appointed assistant geologist in the water resources branch of the Geological Survey.

LEWIS C. EVERARD has resigned as editor and chief of educational cooperation, United States Forest Service, to become editor for the American Association of Museums. He will have charge of the editing, distribution and sale of all the publications of the association, including the periodical *The Museum News*.

PROFESSOR ALBERT VAN HECKE, head of the civil engineering department of Louvain University, visited recently the Engineering Foundation in New York City. His purpose is to spend several weeks in study of recent advances in engineering research and practise in this country.

CHARLES R. FETTKE, professor of geology at the Carnegie Institute of Technology; W. A. Copeland, assistant professor, and W. H. Seifert completed the field work on the geological survey of the Bradford oil field of northwestern Pennsylvania and adjacent parts of New York state during the past summer for the Pennsylvania Topographic and Geologic Survey, and have returned to Pittsburgh.

DR. C. E. RESSER, of the U. S. National Museum, has returned from a three months' field trip, mostly in the Rocky Mountains of Montana. Collections of fossils and stratigraphic information were obtained in furtherance of his studies on the lower Paleozoic formations.

DR. WALTER B. CANNON, George Higginson professor of physiology at the Harvard Medical School, spoke on "Function of the Sympathetic System in Maintaining the Stability of the Organism," at a meeting of the Institute of Medicine of Chicago and the Society of Internal Medicine of Chicago, on October 25.

PROFESSOR HENRY B. WARD, of the University of Illinois, recently gave a lecture at Cornell University, on "The Pacific Salmon."

ON November 14, Professor G. Carl Huber, of the University of Michigan, lectured at Northwestern University Medical School on "Peripheral Nerve Repair." This was the inauguration of the Stephen Walter Ranson Lectureship, which on this occasion was formally presented to the university by the local chapter of the Phi Beta Pi Fraternity. The establishment of these lectureships is a national policy sponsored by

the fraternity and, as in this instance, each bears the name of some distinguished alumnus.

DR. WILLIAM GERRY MORGAN, president elect of the American Medical Association, gave an address at The New York Academy of Medicine on November 6, on "The Part the Community Can Play in Improving Public Health through Preventive Measures."

PROFESSOR ALEXANDER SILVERMAN, head of the department of chemistry of the University of Pittsburgh, addressed the Chicago section of the American Chemical Society on November 22, on "Glass Manufacture in the Twentieth Century."

PROFESSOR R. B. THOMSON, head of the department of botany, University of Toronto, delivered his presidential address to the Royal Canadian Institute on November 2. His subject was "Botany of the Past and Present."

SIR WILLIAM B. HARDY, director of the low temperature research station of bio-chemistry and biophysics of the University of Cambridge, will deliver the Abraham Flexner Lectures for 1930–31 in the Vanderbilt University School of Medicine. The lectureship was established in the Vanderbilt University School of Medicine in 1927 by Mr. Bernard Flexner, of New York City, the lecturer spending a period of two or three months in residence at the school of medicine. Dr. Heinrich Pohl, director of the Anatomical Institute of Hamburg, delivered the first lectures of this foundation last spring.

DR. JOHN H. STOKES, professor of dermatology and syphilology in the University of Pennsylvania School of Medicine, delivered the annual Briggs Memorial Lecture on "The Syphilology of To-day and To-morrow: A Speculative and Critical Appraisal," on November 25, at the New York Academy of Medicine under the auspices of the New York Tuberculosis and Health Association and the New York County Medical Society.

THE board of regents of the University of the Philippines has established the Baker Memorial professorship in the College of Agriculture, in memory of the late Dean Charles Fuller Baker, who died in July, 1927. This professorship will provide for the service of a man from abroad, who will be in residence at the college for at least eight months, and will teach five hours a week.

ORSON BENNETT JOHNSON, professor of zoology at the University of Washington twenty years ago, whose death occurred in 1917, will have his memory perpetuated by the new building for biology, on which construction will begin January 1. The building, which will cost $455,000, will be known as the Orson Bennett Johnson Biological Laboratory.

FRIENDS of Professor Chandler presented in 1910 to the trustees of Columbia University a sum of money which constitutes the Charles Frederick Chandler Foundation. The income from the fund is used to provide a lecture by an eminent chemist, and to provide a medal to be presented to the lecturer in further recognition of his achievements in science. Previous lecturers of this foundation have been Leo H. Baekeland, W. F. Hillebrand, W. R. Whitney, F. Gowland Hopkins, Edgar F. Smith, Robert E. Swain, E. C. Kendall, S. W. Parr, Moses Gomberg, and J. Arthur Wilson. The lecturer this winter will be Dr. Irving Langmuir, president of the American Chemical Society, and assistant director of the research laboratory of the General Electric Company. Dr. Langmuir's subject will be "Electrochemical Interactions of Tungsten, Thorium, Caesium and Oxygen." The lecture will be given in Havemeyer Hall, Columbia University, on December 13.

Industrial and Engineering Chemistry notes that arrangements by the Royal Institution for the celebration of the centenary of Faraday's discovery of electromagnetic induction are progressing. At the representative meeting held at the house of the institution on February 5, the formation of two committees was agreed to, and these committees are now at work. The first, consisting of representatives of the Royal Society, the British Association, and other scientific societies, as well as the Royal Institution, is concerned with the purely scientific aspects of Faraday's work in relation to the proposed celebrations. The second committee, which has been called together by the Institution of Electrical Engineers, consists of representatives of the principal organizations of those industries which have risen in the past hundred years upon the scientific foundation of Faraday's discoveries, and is dealing with the industrial aspects of the celebrations. The two committees are working in close cooperation; the preliminary discussions indicate that the significance of the centenary is very widely appreciated and that the celebrations are likely to arouse world-wide interest and support. The dates have now been fixed, and the proceedings will commence in London on Monday, September 21, 1931. Further during the week the British Association will hold its centenary meeting in London, beginning on September 23. Dr. Elihu Thomson, director of the Thomson Research Laboratory of the General Electric Company, at Lynn, Massachusetts, has appealed for the hearty participation of American scientific men in the Faraday celebration.

ELEVEN professorships have been named at Columbia University in honor of men who played prominent rôles in the institution's development. These include: Hosack professorship in the faculty

of medicine, in memory of David Hosack, professor of botany, 1795–1811, and professor of materia medica, 1796–1811—to be held by Dr. Charles C. Lieb, of the department of pharmacology. Stevens professorship of mechanical engineering, in memory of John Stevens, of the class of 1768, a pioneer in engineering research—Charles E. Lucke, of the department of mechanical engineering. Renwick professorship of civil engineering, named for James Renwick, of the class of 1807—James Kip Finch, of the department of civil engineering. The Vinton professorship of mining engineering, in memory of Francis E. Vinton, professor of civil engineering from 1864 to 1877 and a builder of the original school of mines—Thomas Thornton Read, of the department of mining. The Newberry professorship of geology, in memory of John S. Newberry, professor of geology and paleontology, 1866–1892—Charles P. Berkey, of the department of geology and mineralogy.

THE annual meeting of the Society of Experimental Biology was held recently in Florence on the occasion of the congress of the Association for the Advancement of Science. Professor Beccari, of the University of Florence, presided. He was assisted by Professor Filippo Bottazzi, general secretary of the society, a member of the department of physiology in the University of Naples.

A DINNER to celebrate the twentieth anniversary of the mental hygiene movement was given in New York City, under the auspices of the National Committee for Mental Hygiene and the American Foundation for Mental Hygiene. Dr. William H. Welch, director of the department of the history of medicine of the Johns Hopkins University, and honorary president of both organizations, presided. Dr. James R. Angell, president of Yale University, spoke on "Mental Hygiene in the College and the University." Dr. William A. White, superintendent of St. Elizabeth's Hospital, Washington, D. C., member of the executive committee of the national committee, and president of the First International Congress on Mental Hygiene, reviewed twenty years of the movement, and discussed the coming international congress. Clifford W. Beers, founder and secretary of the national committee and of the foundation, and Dr. Frankwood E. Williams, medical director of the national committee, also spoke.

UNIVERSITY AND EDUCATIONAL NOTES

GIFTS and bequests to Teachers College, Columbia University, amounting to $534,047 were announced on November 15 by Dean William F. Russell. Among the gifts are $100,000 from the General Education Board for the Lincoln School, $90,000 from the Laura Spelman Rockefeller Memorial for the Child Development Institute, $85,000 from the International Education Board for the International Institute, $27,500 from the Institute of Social and Religious Research for the Character Development Inquiry. The General Education Board had voted to complete the endowment of $3,000,000 for the perpetuation of educational research through the Lincoln Experimental School, a subdivision of the college.

IN the will of Dr. John F. B. Weaver the school of medicine of the University of Maryland has been named residuary legatee of his estate and is expected to receive about $150,000.

THE General Education Board has appropriated $50,000 to Morgan College, Baltimore, for the erection of a science hall.

DR. ALAN M. CHESNEY has been appointed dean of the medical school of the Johns Hopkins University, succeeding Dr. Lewis H. Weed, who has been carrying on the work of professor of anatomy as well as that of dean and wishes to devote his time to the work in anatomy. Dr. Chesney has been associate professor at the university since 1921.

OSKAR BAUDISCH, who received his Ph.D. from the University of Zurich in 1904, has been appointed a research associate in organic chemistry at Yale University with assignment to the graduate school and with the rank of associate professor.

FOR the present academic year Dr. George Hume Smith, formerly of the University of Illinois, is acting as assistant professor of botany in the University of Missouri.

APPOINTMENTS of instructor in inorganic chemistry at the Massachusetts Institute of Technology are Dr. Charles E. Teeter, Jr., who has been research associate at the University of California; Dr. Ralph P. Seward, of Brown University, who has been teaching in Brenau College, Georgia; Dr. Herschel Hunt, formerly research fellow at Indiana University, and Mr. A. Sherrill Houghton, who has been teaching at the University of Colorado for the past three years.

JAMES R. MATTHEWS has been appointed to the professorship of botany at the University of Reading which has become vacant through the resignation of Dr. W. Stiles, now professor of botany at the University of Birmingham. Mr. Matthews is at present a lecturer at the University of Edinburgh.

DR. ROBERT ROBINSON, professor of organic chemistry in the University of London, has been elected to the Waynflete professorship of chemistry in the University of Oxford.

DISCUSSION

THE FALLING OF THE DEW

THE problem of the "falling" of dew has long been one concerning which there are many men of many minds, and their confusion is still confounded, as evidenced by several recent articles about it in *Nature*. One group, esthetic and poetical, says that dew falls, and says it in language often so beautiful that it would be all but sacrilege to question its truth. Another group, looking at the other side of the shield, or, literally, the underside of the leaf, insists that it rises. A third, and pacifist group, urges that both are right, that dew rises and dew falls. This leaves room for only the iconoclast, and that room is taken, for there are those who are emphatic in their statements that it neither rises nor falls. Well, as usual, they are all right and all wrong—each right according to his own definitions of the terms used, and wrong according to the other fellow's definitions.

According to my understanding, all dew is liquid water, except, of course, mountain dew, if any one insists on being so meticulous. Furthermore, it is that particular liquid water that has condensed onto relatively cold objects (objects whose temperatures are below the current saturation or dew point) from immediately adjacent water vapor. According to this definition dew, a mass of liquid water, does not fall. That would be rain, drizzle or the settling of fog or haze—the descent of water-drops. But even so we can speak of the falling of the dew in the same correct sense that we speak of the falling of the night, that is, in the sense of gathering as if by falling, or merely in the sense of occurring. And this, I believe, is what most of us, poets and all, mean when we speak of the falling of the dew—merely that it is forming or gathering.

However, one may insist, and some do so insist, that even if dew is formed by the condensation of water vapor, the vapor molecules had to get to the place of condensation by motion in some direction—down, up or sidewise. If the air is still, and if the top of an object is bedewed (a very common occurrence) we doubtless would be right in insisting that the final travel of the vapor was downward, wherever it originally started from and however tortuous its intervening path. In this sense, the sense of final course of the vapor molecules that go to make it, some dew does fall—does go down—not owing to gravitation, but to difference in vapor pressure, a pressure that is least at the place of condensation where the vapor is continuously disappearing or flowing away as if into a sink. In exactly this same sense the dew on the underside of an object, a leaf, for instance, has risen.

Many of the "dewdrops" on the tips of grass and other growing vegetation have not been produced by condensation at all, but by exudation—the flow of water up the leaf and out at its tip or tips. This false dew has, in general, risen. Also it may happen that the absolute humidity (quantity or mass of water vapor per unit volume) immediately over a bedewed lawn, say, is quite as great during the formation of the dew as it was immediately before, owing to an abundant supply of vapor from the damp sod beneath. In this case it may be said that all the dew has risen, the dew on the upper side as well as that on the under side of each and every object.

If, therefore, we adequately prepare the way by definitions appropriate to our needs, we can correctly say that dew falls (in either of two senses), rises, does both or does neither.

How then about frost—is that frozen dew? Dew in the sense above used, liquid water condensed from vapor, freezes whenever, after it has formed, the temperature falls sufficiently low, whereupon it becomes a kind of frost, but not the fine, white, feathery sort known as hoar frost. This latter variety, by far the more common, is formed by the direct condensation of water vapor into ice. It does not pass through the liquid state, hence never was dew and therefore is not frozen dew, as dew is here defined.

W. J. HUMPHREYS

U. S. WEATHER BUREAU

RETREAT OF CAVELL GLACIER

A NOTEWORTHY instance of the retreat of a valley glacier was confirmed by the Princeton International Summer School of Geology and Natural Resources during the past summer. Two years ago Dr. E. M. Kindle, of the Canadian Geological Survey, established a datum point and line of measurement to the foot of Cavell Glacier, on the north side of Mount Edith Cavell in Jasper Park, Alberta. On July 17, 1927, the measurement made by Dr. Kindle from the datum point to the ice front was 322 feet 6 inches. About a month later, on August 22, the distance had increased to 342 feet, showing a retreat of 19 feet 6 inches in 35 days. At this time, the glacier was visited by the 1927 party of the Princeton Summer School, in company with Dr. R. M. Field, Mr. E. B. Bailey, Dr. L. A. Collet and Dr. Kindle, and several general observations were made. On July 26, 1929, the glacier was revisited and measured by the writer and other members of the Princeton party. The distance from datum point to ice front had increased to 415 feet. This indicates a retreat of 92 feet 6 inches in two years.[1]

The direct evidence of retreat is supported by other observations showing changes in the surface features

[1] For photographs of this glacier see "The Geological Story of Jasper Park," by E. M. Kindle, pp. 38–40, 1929, National Parks of Canada, Department of Interior, Ottawa.

of the glacier in 1929, as compared with 1927. In the latter year, a transverse ridge of debris, formerly crevasse filling, was exposed on the ice a few yards back of the ice foot; this ridge, in 1929, is twenty feet or more in front of the ice. The ice near the foot of the glacier seems much more laden with debris than was the case two years ago and there has apparently been a considerable shrinkage in the thickness of the glacier, which has left a residue of numerous rock fragments exposed on the ice surface. No moraine is visible near the line occupied by the ice front in 1927, and this would indicate that the retreat has been continuous and gradual for more than two years. Most of the new deposits have been left as scattered ground moraine, extensively reworked by outwash from subglacial streams.

Since the lower glacier is comparatively small, the figures and other data lead to some speculation concerning its future condition. This is of especial moment since an automobile highway for the convenience of sightseeing has been recently completed to the glacier, at a considerable cost.

E. L. PERRY

WILLIAMS COLLEGE

OUTCROP VS. EXPOSURE

IN geologic descriptions of rock units, it is generally convenient if not necessary to distinguish between areas in which a particular formation directly underlies the surface of the ground and those specific points where the formation is visible at the surface as in a ledge. In the majority of stratigraphic descriptions, the terms "exposure" and "outcrop" are used interchangeably for either of the above conditions with the result that the exact meaning of a phrase is often obscure. For example: "This exposure of the shale is directly south of the outcrop of the limestone"; "Cleavage occurs throughout the exposure"; "The main road passes near an exposure of the limestone." Without additional qualifying phrases, it is not at all clear in these sentences whether the term "exposure" refers to a specific visible *exposure* of the rock, or merely to a belt where the formation is the surface bed-rock. Such difficulty of expression can readily be avoided by attaching a definite meaning to each of the terms in question. It would seem to be a decided convenience if geologic authors would consistently use the term "exposure" for points where a particular formation is exposed to view, and would restrict the term "outcrop" to those areas where the formation makes up the bed-rock directly below the surface of the ground. One would thus describe such points as ledges, road-cuts and other bare rock surfaces as exposures, while the area or surface extension of the formation would be described as its outcrop. This restriction of meaning is entirely in accord with the etymology of the two words and should be simple to put into practice. Its use should avoid many ambiguous phrases.

HERBERT P. WOODWARD

NEW JERSEY LAW SCHOOL,
OCTOBER 27, 1929

ON NEW LAWS FOR THE SOLAR SYSTEM

MY attention has been drawn to an interesting article by Dr. W. M. Malisoff appearing in the issue of SCIENCE for October 4. Reference is made to a law proposed by me, and since his first paragraph may be somewhat misleading I am taking the liberty of clarifying the situation.

It is obvious that the percentage deviations given in my original article refer to the integers and not the *squares* of the integers (the italics are his). This is no correction but a variation in statement. In his section (4) Dr. Malisoff has done precisely the same thing that he condemns in his section (2). Both the laws he states in his sections (4) and (5) follow directly from the law stated by me coupled with Kepler's laws or the law of gravitation, and are subject to the same discrepancies.

Sections (6) and (7) are interesting, and one could wish that the author had given numerical data in support of the laws stated therein.

A. E. CASWELL

UNIVERSITY OF OREGON

CONTINUED GROWTH OF AMERICAN CHESTNUT

THOSE who have followed progress of the chestnut blight may be interested to learn that the grove of trees earlier reported[1] still continues vigorous growth. This grove, located on Chester stony loam in the Piedmont just west of the coastal plain, consists of old trees of twelve to sixteen inches diameter breast high. The trees were earlier blighted and most of the crowns were killed but they have partially replaced the crowns. New growth is distorted by cankers which do not, however, seem to impede development; each year some twigs and branches are blighted but per cent. of killed tissue is small compared with new production. Although most species of nut trees are virtually devoid of fruit this year (1929), the chestnut trees bore a fair crop. On visiting the grove on September 19 the writer found the ground littered with burs thrown down by a squirrel; the burs contained one to three plump nuts, a proportion of which were parasitized as in earlier years by a larva, possibly that of the nut-weevil *Balanius caryatrypes*.

ARTHUR P. KELLEY

MALVERN, PA.

[1] A. P. Kelley, "Conservation of Our Native Chestnut," SCIENCE, n.s., 63: 476–477, 1926.

SPECIAL ARTICLES

THE PROTOZOA OF WILD MONKEYS[1]

RECENTLY, the writer[2] published the results of original observations and a review of literature on the protozoa of monkeys. In this paper it was pointed out that twenty-five different species of protozoa were recognized by protozoologists at the present time as inhabitants of man. Sixteen of these twenty-five species had been reported from monkeys; these sixteen species were morphologically indistinguishable from the corresponding species that occur in man. Certain experimental evidence was also cited as evidence that some of the species that live in monkeys and man are the same. Since then additions have been made to the number of species that have representatives in both monkeys and man. Kofoid[3] reports that the mouths of all of a number of captive specimens of *Macacus rhesus* and *M. cynomolgous* were infected with amebae indistinguishable from *Endamoeba gingivalis* that lives in the mouth of man. He states that all of nine monkeys examined were free from the trichomonas of the mouth, *Trichomonas buccalis*. This species, however, has been noted in a number of Philippine monkeys examined by the writer during the past three months. Dobell[4] has listed from monkeys a flagellate resembling *Tricercomonas intestinalis* which had not been reported previously. When these three species are added to those already recorded, the number of species of protozoa that occur in both monkeys and man is increased from sixteen to nineteen. As pointed out in a previous paper[2] other species of lower animals, such as the rat, may be infected with protozoa belonging to the same genera as those living in man, but to species that are morphologically so different as to be easily identified. The conclusion reached on the assumption that close relationships of parasites indicate a common ancestry of their hosts was that "the facts available regarding the protozoan parasites of monkeys and man furnish evidence of importance in favor of the hypothesis that monkeys and man are of common descent."

It was realized that one difficulty in reaching a definite conclusion was the fact that apparently the monkeys that had been studied were captive animals that had been associated more or less closely with man for a sufficient length of time to become infected with human parasites. The protozoa that were reported from monkeys may, therefore, not have been normal inhabitants of these animals, but human protozoa that had become established as a result of contamination from man. On this account, the writer at the first opportunity undertook a study of the protozoa of wild monkeys. The animals used belonged to the species common on the Island of Luzon, one of the Philippine Islands, the scientific name of which is usually given as *Macacus philippinensis*. Wild monkeys were either captured and brought to Manila for study or were shot and examined in the field within three hours. A comparative study is being made of the organisms found, but enough evidence was soon obtained to prove that wild monkeys are infected with most, if not all, of the species of protozoa that have been found in captive specimens. Amebae and trichomonad flagellates have been found in the mouths of many of them. Several monkeys were infected with the flagellate of the duodenum, *Giardia*. Trichomonad flagellates were found in the vagina of one specimen. The large intestine in man is the habitat of five species of amebae, four species of flagellates and one ciliate. Only one of these, the ameba, *Dintamoeba fragilis*, has not been recorded from monkeys. Most of these species were definitely recognized in the wild monkeys examined by the writer. Further study will probably reveal the rest. The large ciliate, *Balantidium coli*, was present in a considerable proportion of the monkeys, especially in the cecum. *Trichomonas* occurred in the colon of almost 100 per cent. of the monkeys. *Chilomastix* did not have quite such a high incidence. Small flagellates were noted which will probably turn out to be *Embadomonas* and *Tricercomonas* on further study.

Every animal harbored one or more species of ameba in the cecum or colon; these belonged to species resembling *Endamoeba histolytica, E. coli, Endolimax nana* and *Iodamoeba williamsi*. No trypanosomes or malarial parasites were discovered in the blood of the wild monkeys available for study.

These findings make it evident that, so far as intestinal protozoa are concerned, wild monkeys are apparently as heavily infected as captive monkeys. A pertinent question that arises is, are these wild monkeys closely enough associated with the rural inhabitants of the Philippines to become infected with human species of protozoa by contamination? It is not possible to answer this question definitely. Wild monkeys, however, spend much of their time in the trees away from soil which has been polluted by man and they particularly shun human excrement. It seems, therefore, that while transmission from man to wild monkeys is possible, it is not probable, and that the protozoan parasites now living in monkeys

[1] From the department of parasitology, School of Hygiene and Public Health, University of the Philippines.

[2] Robert Hegner, "The Evolutionary Significance of the Protozoan Parasites of Monkeys and Man," *Quart. Rev. Biol.*, 3: 225–244, 1928.

[3] C. A. Kofoid, "The Protozoa of the Human Mouth," *Journ. Parasit.*, 15: 151–174, 1929.

[4] C. Dobell, "Amebae of Monkeys," Rept. Med. Res. Council, 1924–25: 31–33, 1926.

are descendants of those that inhabited the common ancestors of man and monkeys.

ROBERT HEGNER
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VELOCITY OF CHEMICAL REACTIONS[1]

IT is well known that different chemical reactions progress with greatly different velocities. For examples, the oxidation and drying of linseed oil extends over a period of days, while the explosion of gasoline vapors is completed in a small fraction of a second. In most cases where velocities of reactions are recorded they are expressed as the total mass transformed per unit of time, $\frac{dc}{dt}$, and the absolute time required for the transformation of individual molecules is ignored or can not be estimated because there are very few methods for studying intramolecular mechanics and dynamics. In the case of explosions, however, data are available for the estimation of the time required for the reaction to proceed from molecule to molecule, as the following calculations will show.

When nitroglycerine explodes according to the reaction:

$$4\ C_3H_5(NO_3)_3 \rightarrow 12\ CO_2 + 10\ H_2O + 6\ N_2 + O_2$$

the explosive wave travels at the rate of five miles per second through the mass.[1] It might be argued that the explosive wave precedes the course of the chemical reaction, but since the exact nature of the former is unknown, it seems reasonable to conclude that it merely measures the progress of the chemical reaction from molecule to molecule. With this assumption the following calculations can be made.

The molecular weight of nitroglycerine is 227.1 and its density is 1.6, giving a molecular volume of 141.9 cc. Assuming this volume of nitroglycerine to be in the form of a cube, each edge will be $\sqrt[3]{141.9}$ cms and will contain $\sqrt[3]{(6.06)(10)^{23}}$ molecules, or $(1.622)(10)^7$ molecules per linear centimeter. In five miles there are $(8.047)(10)^5$ cms, so that a chain of nitroglycerine molecules five miles long, spaced as they are in the liquid, contains $(1.305)(10)^{13}$ molecules. Since the reaction proceeds from the first of these to the last one in one second, the time required for the explosion to go from molecule to molecule is $\frac{1}{(1.305)(10)^{13}}$ or $(7.661)(10)^{-14}$ seconds.

To conceive of this infinitesimal time, let us compare it to one second, which is the time of explosion of the entire mass and also approximately the lowest perceptible time unit. Making this comparison, since one year contains $(3.1536)(10)^7$ seconds, we find that 414,000 years bear the same relation to one second that one second bears to the time between successive explosions. In other words, if a being could take the time of a molecular explosion for his smallest perceptible time unit, then one of our seconds would bear the same relation to his time value that a geologic age does to our second.

In the above reasoning the assumption is made that a molecule of nitroglycerine explodes, sending out a wave of energy which upon striking the next molecule causes its explosion, whereupon the process is repeated; the disruption of the original molecule is assumed to be completed by the time its explosive wave has initiated the explosion of the next molecule; finally, the explosion of each molecule is assumed to be dependent upon energy received from the molecule immediately preceding. Under these conditions the time which we have calculated, namely $(7.661)(10)^{-14}$ seconds, represents the time required for a molecule both to complete its own explosion and to initiate the explosion of its neighbor through an energy transfer. It is impossible to estimate the relative times required for these two processes; however, it is at least true that the time of the individual molecular reaction is less than the number calculated.

While at present it is impossible to follow the breaking down of such individual molecules, and although thermodynamics as yet can not treat such reaction rates, still it can be concluded that with some chemical reactions their infinitesimal times bear a ratio to the times of human experience that the latter do to geologic and astronomical times.

THEODORE W. EVANS
WILLIAM M. DEHN

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UNIVERSITY OF WASHINGTON

[1] Comey, Seventh Int. Cong., 1909, III b, 30.

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MIRSKY, A. E., AND ANSON, M. L. Protein coagulation and its reversal. The reversal of the coagulation of hemoglobin.

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SCIENCE NEWS

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SUBMARINE LANDSLIDES

UNDER-SEA landslides, set in motion by the earthquake on November 18, were the cause of the breaks in trans-atlantic cables at that time, in the opinion of Commander N. H. Heck, in charge of the U. S. Coast and Geodetic Survey's investigations in seismology. With the aid of data gathered from seismograph stations by *Science Service*, Commander Heck and his associates determined the approximate center of the earthquake at 10:00 P. M. on Monday, less than seven hours after the quake had occurred.

The wide-spread area over which this quake was felt, the serious tidal waves that were caused and the breaks of the cables, all show that it was one of the most severe ever experienced in the eastern part of North America. Evidently is was deep-seated under the ocean bed. Thus, instead of having a small, well defined center, it seems to have centered over a large area.

In this part of the ocean, just off the edge of the continental shelf, the ocean bottom has a steep slope, and so the shake doubtless caused submarine landslides which broke the cables. The origin, off the coast of Newfoundland, was well to the north of most of the breaks, at approximately 44 degrees north latitude and 58 degrees west longitude. This point is about 180 miles off the Newfoundland coast.

The vibrations of the shock, traveling through the earth to the sensitive seismograph instruments at a number of observatories, carried the news to the world many hours before the telegraph lines carried news of its effects. Using a special code, several of the most important of these stations telegraphed their data to *Science Service*. Commander Heck was able to tell the distance of the center from each of the stations reporting. Correlating these, he determined the approximate position of the quake's center, which was announced through *Science Service* at 10:30 P. M. the same day. A quake such as this is very difficult to locate accurately because of its large area. The vibrations which arrive at different observatories may come from different parts of the shaken area. Then it would be quite impossible to fit them all together.

Commander Heck estimates that the tremor was severe enough to be felt as a strong shock over an area of 200,000 square miles, mostly at sea. Over a still larger area, about 1,500,000 square miles, the earth quivered sufficiently to cause a perceptible shaking on land. A shock must be quite strong to be perceptible to a ship. A quake in this region is quite unprecedented and shows that any part of the earth is liable to such shocks. However, there is no evidence that any further shocks will occur in the same locality.

A NEW BAKING POWDER

A BAKING POWDER which does not leave a residue in the finished bread or cake has just been worked out in the chemistry laboratories at the University of Wisconsin, by Edwin O. Wiig. This new leavening agent has as its active agent acetonedicarboxylic acid, which during the baking process disappears entirely as gases.

The formation of carbon dioxide, the gas which "raises" the cake, is only part of the story of baking powder. The other part concerns the product which remains in the cake as a residue. The various commercial baking powders on the market at present leave as residues saline cathartics, such as sodium tartrate, Rochelle salt, disodium phosphate, sodium sulfate or aluminum hydroxide. There is still a question as to the possible ill effect of some of these materials upon health. Hence the advantage of a baking powder which leaves no residue whatsoever. Acetone is the only other substance formed besides carbon dioxide, and the acetone completely evaporates at baking temperatures.

The new powder depends for its action on combination with the water of the dough, just as do the present powders. Hence in order to protect it from atmospheric moisture it is mixed with starch. This corn-starch has a second function, more important than that just mentioned. Starch makes it possible for the chemist to standardize his product. All baking powders must have approximately the same "raising" strength to make possible the use of any recipe. The housewife-consumer will not consult the label of her tin of baking powder, and then compute whether the "two tsps. b. p." of her recipe should be doubled or halved. Starch takes care of any variation in the amount of carbon dioxide given off by active agents of different compositions.

The keeping properties of acetonedicarboxylic acid baking powder are excellent, as Mr. Wiig has shown by various tests. It needs only to be kept in the customary moisture-proof tin. The keeping power of a product is of utmost importance to the manufacturer.

Further study of the suitability of acetonedicarboxylic acid as a leavening agent is being continued at the University of Wisconsin. The question of a cheaper source of raw material is still under investigation. At present citric acid is the raw material used in the making of acetonedicarboxylic acid. Cull lemons form the natural source of citric acid and is the principal one in use. A shorter name for the substance would also be highly desirable, but that is a simple problem.

VARIETIES OF GORILLAS

LIKE their more successful and more wide-spread human cousins, the gorillas of equatorial Africa are all members of one species. Within the species, they can be definitely differentiated into two zoological varieties, called for convenience the coast and the mountain varieties. Beyond this, all differences hitherto described can not be made out as anything more than local and probably fluctuating and impermanent.

These conclusions are set forth by a young Harvard zoologist, Harold Jefferson Coolidge, Jr., in a monograph

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on this interesting genus just off the Harvard University Press. Mr. Coolidge has made an exhaustive study of all available skeletal material on the gorilla and has examined all the scientific literature in existence bearing on the question of its zoological position.

The first scientific description of the gorilla was published in 1847 by Dr. Thomas Savage and Dr. Jeffries Wyman, who regarded the animal as a new species of orang-utan. Later, its claim to recognition as a different genus was advanced, and many zoologists proceeded to split it up into a considerable number of different species. Of recent years, however, the tendency has been to reduce the number of species, and now Mr. Coolidge gets it back down to one, with two distinct subspecies.

The two varieties, coast and mountain gorillas, live in ranges separated from each other by a considerable stretch of territory in which there are apparently no gorillas at all. Thus isolated and prevented from interbreeding, each group has developed and preserved certain peculiarities of its own, most notably in the proportions of the skull. The coast gorilla has a skull that averages a little longer and wider than that of the mountain variety, but the mountain gorilla has a larger jaw and ampler mouth cavity than his lowland brother possesses.

MAGGOTS TO FIGHT INFECTIONS IN WOUNDS

MAGGOTS, the tiny crawling larvae of blow-flies, may prove to be of great value in preventing and checking wound infections. This new method of treating wounds which is now being investigated was developed from observations made during the war by an American surgeon, Dr. William S. Baer, now clinical professor of orthopedic surgery at the Johns Hopkins University School of Medicine.

Dr. Baer noticed that when the wounded men had been lying out on the ground for some time before being brought to the dressing station, their wounds were covered with tiny maggots, the larvae from which common flies develop. But these men, strangely enough, did not develop infections in their wounds, as did those whose wounds had been dressed and treated very soon after their infliction. The men who had been lying on the ground untreated the longest and who had the most maggots crawling on their wounds were the ones who did not develop any infections.

Further investigation of this unexpected state of affairs disclosed that the maggots were eating the dead tissues, bone and flesh, and thus destroying the material that would have furnished good breeding grounds for bacteria. The bacteria which might have got into the wound and set up an infection were unable to exist in the wound which the maggots had cleaned up.

After the war Dr. Baer remembered the action of the maggots when he was treating children suffering from osteomyelitis. This disease is an inflammation of the bone, more common in children than in adults. It is the result of an infection and requires prompt surgical treatment. Recovery is often delayed for years if the disease reaches the chronic stage. In order to hasten the healing of the wound after operating on this condition, Dr. Baer has been using maggots with good results. The tiny creatures consumed all the dead tissue about the wound and the bacteria which had been causing the infection soon died from lack of sustenance.

The investigations along this line were abruptly halted during the first winter, when the cold weather killed the flies and so cut off the supply of maggots. Now, however, this contingency has been provided for, and Dr. Baer has a plentiful all-year-round supply.

TROPICAL DIET

Too much starch and sugar, too few vitamins and too little of fatty and proteid foods are found in the diet of tropical peoples. This faulty diet is reflected in the health of the people, Dr. Seale Harris, of Birmingham, Ala., told members of the American Society of Tropical Medicine at their recent meeting.

"Ignorance and laziness are the chief reasons why the inhabitants of tropical America live largely on white flour, white meal, polished rice, dried fish, coarse tubers and white sugar products, because with a very little effort they could make their fertile lands produce a delicious and wholesome variety of foods." The faulty diet is not confined to the poor classes alone in the tropics. Rich and poor alike devote themselves to raising the money crops of sugar, bananas, tobacco and coffee, with little or no farming of the protective foods, such as vegetables, fruits, grains, chickens and cattle, for home consumption.

The faulty diet is probably a predisposing cause of many of the tropical diseases, even when the latter are known to be caused by definite organisms, Dr. Harris said, citing the work of many scientists in support of this theory. He said he believed the food factor was important in both in the number of cases of and the high death rate from all diseases that prevail in the tropics. It appears not unlikely that the ravages of malaria and hookworm may be reduced by improving the nutrition of residents in countries in which these diseases prevail.

Following the theory that the prevailing faulty diet is a factor in the causation of certain tropical diseases, Dr. Harris outlined diets which might be used effectively in combatting these diseases. The liberal use of fresh fruits and vegetables with whole wheat flour and whole grain corn-meal bread was strongly advocated in the treatment and prevention of these diseases, including pellagra and sprue. Dr. Harris considers these foods of far more importance than yeast. Considerable difference of opinion among scientists and physicians still exists on this point, however. The interesting fact that the diet of the poor in rural New York is almost identical with that of the poor in the rural South was pointed out. There were no cases of pellagra found among the poor in a New York rural community who lived on practically the same unbalanced, vitamin-deficient diet as is eaten by the poor in the South. Nor were there any cases of sprue in New York, yet the diet was as unblanced and as deficient in vitamins as that of the poor and rich in Porto Rico where sprue is prevalent. In New York the dis-

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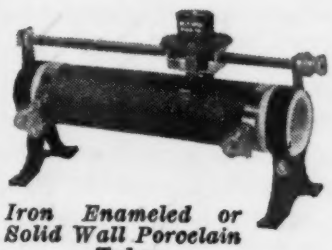

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ease which is found among the undernourished individuals is tuberculosis, a disease due to a pathogenic organism, and while malnutrition is no doubt a predisposing cause of pellagra and sprue, their specific origin has not yet been discovered, at least not to the satisfaction of many clinicians who have had a large experience with those diseases that prevail in some—not all—tropical and subtropical countries.

THE PUEBLO INDIANS

THE Pueblo Indians, who were the most substantial residents of the Southwest for many centuries before the white man's era, were at the height of their development about the time of the Middle Ages, and their decline was sudden and mysterious, Earl H. Morris, archeologist of the Carnegie Institution of Washington, said in an address at the institution on November 26.

During the golden age of Pueblo culture were built the great community houses which stand to-day in impressive ruins in the southwestern states. In these oldest American apartment houses thousands of people lived. The pueblos, as the settlements are called, were located for security against wandering tribes and for their nearness to water supplies and land suitable for farming. The inhabitants produced artistic and unusual pottery.

This Indian culture came very suddenly into flower after a long period of slow growth, Mr. Morris concludes. The most plausible explanation is that nomadic tribes became menacing to the scattered farming Pueblos, and caused the settled people to gather for strength in dwellings that were literal fortresses. Ideas of efficient tribal organization were established, for the great irrigation systems and the building programs would have been possible only by consistent, cooperative effort.

It would seem that this tremendous expansion and building came to an abrupt termination. The latest timbers from the prehistoric sites in widely scattered localities of the San Juan region have been examined by Dr. A. E. Douglass, of the University of Arizona, and he has found that these trees were cut in the same year. No evidence of building activity later than this has been found. Whether drought, pestilence or warfare put an end to the progress of these communities, is one of the problems still to be solved by archeology. At the time the Spaniards arrived in the West the Pueblo golden age was at an end, and many of the settlements were abandoned.

ITEMS

DISCOVERY of a new comet, not in the sky, but on a ten-day-old photographic plate that he was filing, was the recent experience of E. R. Carpenter, of the Seward Observatory of the University of Arizona. The photograph was made of the sky in the constellation of Aries, the ram, on November 2. This star group is now seen high in the southern sky about eleven P. M. At the time the plate was exposed, the comet was not noticed. After Mr. Carpenter found its image on the plate, a further search was made for it in the sky, but the glare of the moon prevented its being seen. When discovered, it was very faint, of the 16th magnitude, and was moving to the southeast. However, it had a short tail, which is rather unusual for so faint a comet.

A NEW sweetening compound which is somewhat sweeter than saccharine and 690 times sweeter than sugar has been prepared by Dr. Henry Gilman and J. B. Dickey, of the department of organic chemistry at Iowa State College, from waste products of corn. The name of this compound is "the *syn*-isomer of 5-benzyl-2-furfuraldoxime." Despite its sparing solubility in water it may become a pattern for new and valuable sweetening compounds. As yet, no study has been made of its physiological action. Unlike other artificial compounds of high sweetening power this compound can be readily prepared from sugar by standard organic reactions. Other raw materials, like paper and cellulose compounds, in general, can be used as a starting point in its synthesis. Previously, Dr. Gilman and A. P. Hewlett prepared a compound from corn-cobs which was 200 times sweeter than sugar.

WHAT is now the world's largest known copper-ore deposit was worked by the prehistoric Incas, judging by remains that have been found at and near the copper mines of Chuquicamata, Chile. Within the mine primitive tools have been found from time to time, such as stone hammers and wooden shovels, as well as mummified remains of early Indian miners, one of which is now at the American Museum of Natural History in New York. The ruins of Pucaro, an ancient fortified city destroyed by the Spaniards during their first invasion of Chile, are 25 miles from Chuquicamata. Ancient graves belonging to this prehistoric city have yielded bowls and other utensils of copper as well as bead necklaces made from brochantite and atacamite, minerals characteristic of the Chuquicamata deposits. The Incas, reputed as pre-Columbian America's best miners and metal workers, conquered this part of Chile about 1443, it is believed, and the old mines may therefore have been worked at least ninety years before the discovery of America.

THE age of Pueblo Bonito and other ruins in the southwest is at last to be revealed by the slow but sure detective methods of science. Telegraphic advice received by Dr. Gilbert Grosvenor, president of the National Geographic Society, states that timbers from ancient trees collected this summer are adequate to complete the long-sought tree-ring calendar. With this as a yardstick it will be possible to date any prehistoric pueblo which has any wooden beams left in the ruins. Dr. A. E. Douglass, astronomer, of the University of Arizona, and Neil M. Judd, leader of the National Geographic Society expeditions to Pueblo Bonito, have studied 5,000 tree sections, including some located this summer after years of search. The calendar up to this season has been carried back to 1260 A. D. and still was not old enough to match the series of years recorded at Pueblo Bonito. Another set of pre-Columbian tree-ring dates covered 586 years in some unknown centuries. The link between the two series has now been discovered, and the dates will soon be announced.

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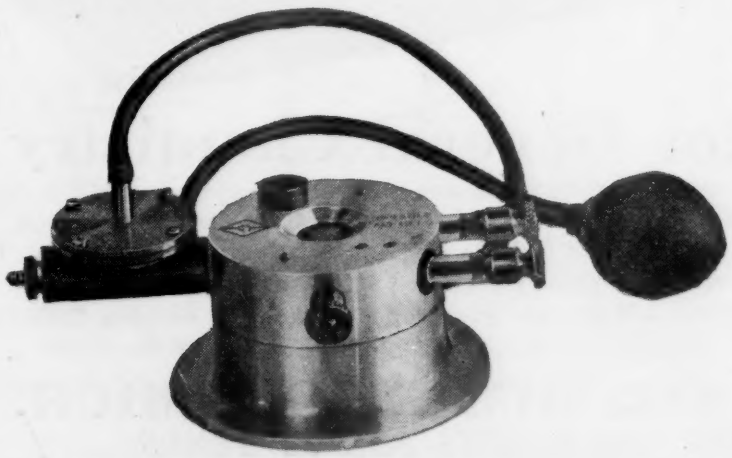

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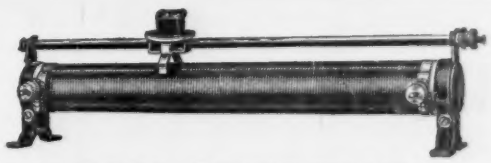

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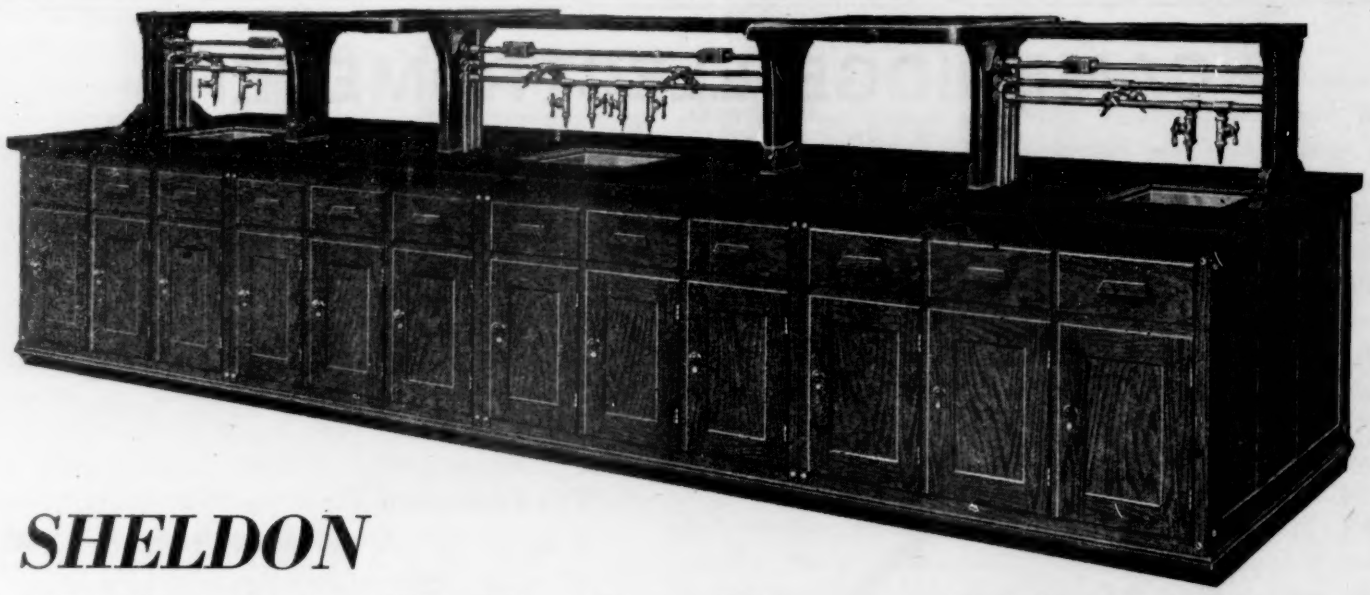

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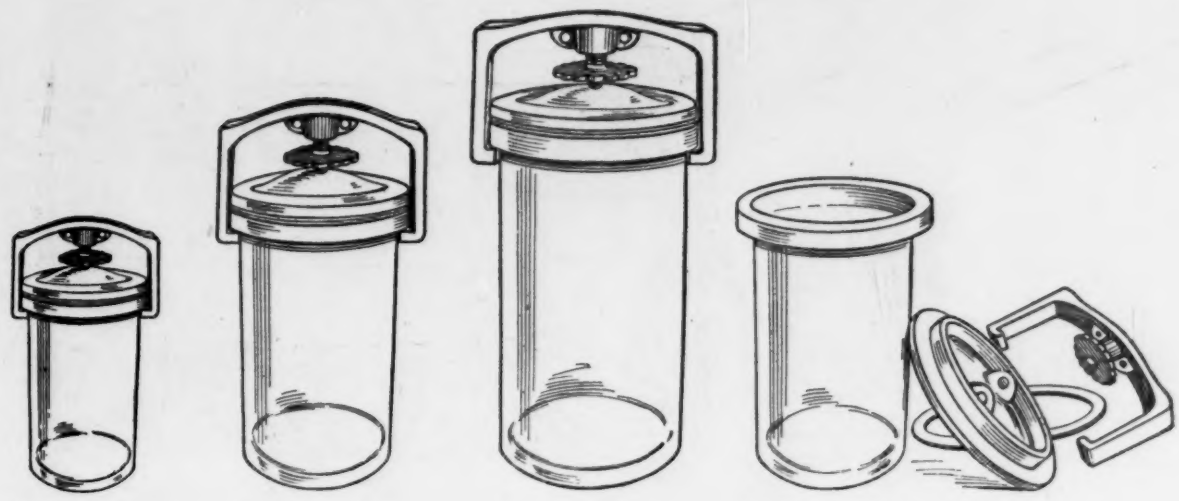

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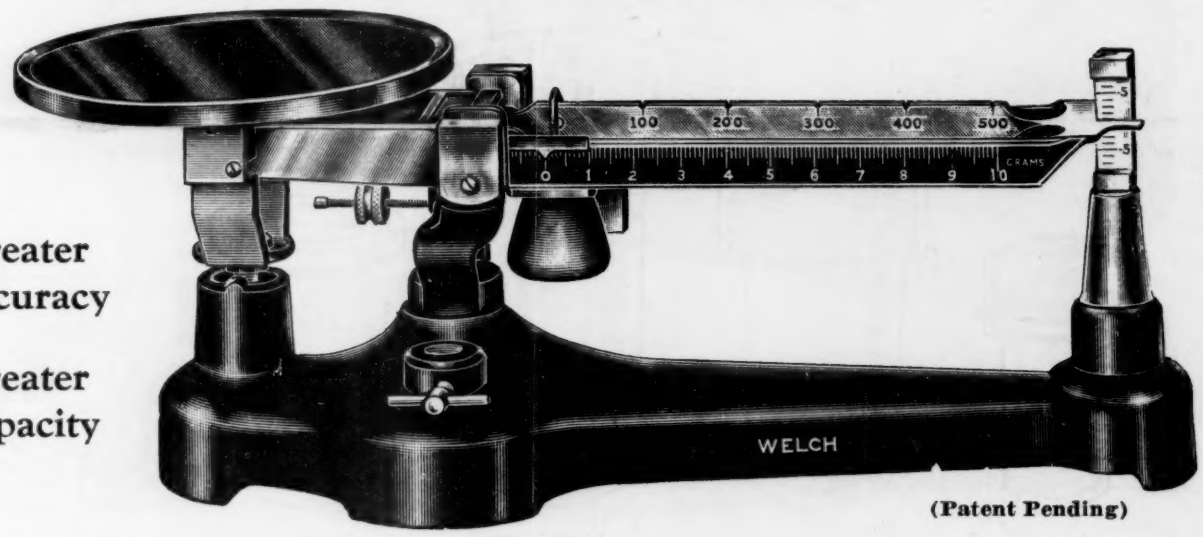

(Patent Pending)

No. 4040

This balance has three times the beam capacity of double beam trip scales.

Specifications

Front beam weighs from 0–10 grams by 0.1 gram
Center beam weighs from 0–500 grams by 100 grams
Third beam weighs from 0–100 grams by 10 grams
Total capacity on beams 610 grams
Total capacity with extra weight 1,010 grams
Sensibility 0.05 gram
Honed knife edges rest on agate planes
Pan made of molded Bakelite

No. 4040 Triple Beam Balance, Harvard Trip Scale construction. Capacity 610 grams, sensibility 0.05 gram. Complete with sliding weights on the beams, each..... **$12.00**
In lots of six or more, each..... **9.00**

No. 4040W Extra Weight, to increase capacity to 1,010 grams..... **1.50**

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